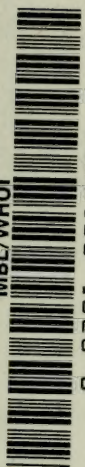


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ICONES MUSCORUM,

OR

FIGURES AND DESCRIPTIONS

OF MOST OF THOSE

MOSES

PECULIAR TO EASTERN NORTH AMERICA

WHICH HAVE NOT BEEN HERETOFORE FIGURED.

BY

WILLIAM S. SULLIVANT, LL.D.,

MEMBER OF ACAD. CÆSAR. LEOPOLD.-CAROL. NATUR. CURIOSORUM; OF THE AMER. PHILOS.
SOC. PHILAD.; OF THE AMER. ACAD. SCI. AND ART, BOSTON; OF THE ACAD.
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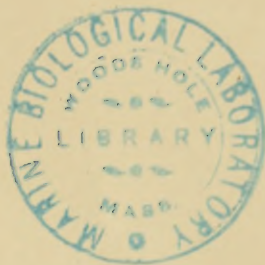
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TO

ASA GRAY, M.D., LL.D.,

FISHER PROFESSOR OF NATURAL HISTORY IN HARVARD UNIVERSITY,

THIS VOLUME IS INSCRIBED,

IN REMEMBRANCE

OF A LONG AND PLEASANT INTERCOURSE IN

BOTANICAL PURSUITS,

BY HIS CORDIAL FRIEND,

THE AUTHOR.

COLUMBUS, OHIO, August, 1864.



ERRATA.


- Page 9, line 19, add "(ex cl. Lindberg.)"
- " 11, " 5, for "subtriunciales" read "subtriuncialis."
- " 12, " 4, for "viridum" read "viridem."
- " 42, " 1, 18, 22, for "polypodiodes" read "polypodioides."
- " 66, " 5, for "distinguitur" read "distinguitur."
- " 77, " 8, for "triplore" read "triplove."
- " 85, " 13, for "subulata" read "subulatis."
- " 95, " 8, for "inferioré" read "inferiora."
- " 102, " 1, for "deformity" read "difformity."
- " 110, " 8, for "ovata" read "ovato."
- " 112, " 20, for "interne" read "interni."
- " 123, " 16, for "unciali" read "lineari."
- " 128, " 24, for "spores" read "sporis."
- " 151, " 24, for "mediocris" read "mediocribus."
- " 163, " 4, for "nitidi" read "nitidæ."
- " 170, " 6, for "opercula" read "operculo."
- " 187, " 19, for "cylindracea" read "cylindraceo."
- " 189, " 16, for "latero" read "latere."

THIS work was originally intended to embrace, as far as practicable, only those species of Mosses peculiar to that portion of North America lying east of the Mississippi River and south of the great lakes and the river St. Lawrence, and of which satisfactory figures had not been published.

Considerable progress had been made in the drawings and engraving, when it was ascertained that not a few species, previously regarded as natives only of Eastern North America, occurred also in Japan and on the adjacent coast of China.* These species, notwithstanding, have still been here retained, together with two or three others from California, for the reason that either no figures of them, or insufficient ones, have heretofore been given.

On the other hand, it will be seen that several species, strictly confined within the proposed limits, are omitted: this is owing to the fact that of some of them excellent figures have elsewhere appeared; and of others, that specimens suitable for illustration were not at command.

* See "Characters of New Mosses, collected by Charles Wright in the North Pacific Exploring Expedition under the Command of Captain John Rodgers, by Wm. S. Sullivan and Leo Lesquereux," in the Proceedings of the American Academy of Arts and Sciences, Vol. IV. p. 275, 1859.



In preparing the illustrations, no pains have been spared to make them as complete as the extent of analysis, and the size of the plate adopted, would allow.

The drawings were made, under my immediate supervision, by Mr. August Schrader, a draughtsman of rare merit. They were engraved on copper by Mr. William Dougal, equally distinguished in his art.

W. S. SULLIVANT.

COLUMBUS, Ohio.

The following works are cited in this volume, and contain nearly all of importance that has been written on North American Bryology.

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ICONES MUSCORUM.



SPHAGNUM MACROPHYLLUM, *Bernh.*

Tab. 1.

PLANTÆ 6–8-unciales, in aquis stagnantibus multo longiores, pallide olivaceo-virides inferne dilute fuscесcentes, siccitate splendentes rigidulæ.

CAULIS simplex vel innovatione semel dichotomus, firmus, fuscus, fasciculatim 3–4-ramulosus: ramulis conformibus strictis divergenti-dependentibus subflabellatim laxius foliosis; strato corticali caulium duplici vel triplici, ramulorum partim simplici partim duplici vel triplici e cellulis inflatis, illis ramulorum par-cissime porigeris, formato.

FOLIA caulina minuta, e basi latissima ovato-oblonga, apice obtusa, integerrima: folia ramulina rigidula, anguste lanceolata, lanceolato-subulata, involuto-concava, apice truncatulo 7–8-dentata, cellulis angustissimis 1–2-seriatis marginata; cellulis hyalinis in foliis caulinis ramulinisque elongatis flexuoso-fusi-formibus poris in linea media longitrorsum positis instructis, fibrillis (ut in tota planta) omnino deficientibus; cellulis chlorophyllosis ad utramque folii faciem emersis inque sectione transversali suborbiculatis.

FLORES dioici: masculi ignoti: feminei in caulis capitulo et laterales laxе gemmacei; archegoniis 3–4.

CAPSULA in pseudopodio breviusculo elata, subglobosa; sporis tetraedris papillulosis sulphureis circa $\frac{1}{800}$ unc. metientibus:

perichætii laxi foliis oblongo-ovatis, supremis convolutis, apice obtuso dentatis, areolatione ramulinorum.

SPHAGNUM MACROPHYLLUM, Bernh. in Brid. Bryol. Univ. 1, p. 10; Drummond, Musc. Amer., Coll. 2, No. 18; Sulliv. Musc. Alleghan., No. 207, Mosses U. States, p. 12; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 1.

ISOCLADUS MACROPHYLLUS, S. O. Lindberg, 1861.

HAB. Swamps in Louisiana, *Drummond.* Raccoon Mountains, Alabama, *Lesquereux.* Green County, Mississippi, *Tice.* New Jersey, *Austin.*

A remarkable peculiarity in this species is the absence of fibrillæ in the hyaline cells of the whole plant. The same occurs in only two other species, viz. *S. Hollianum*, *D. & M.*, and *S. sericeum*, *C. Müll.*, both from the East Indies.

TAB. 1. — SPHAGNUM MACROPHYLLUM.

1. Planta naturali magnitudine.
2. Pars caulis cum ramulo.
3. Eadem cum foliis.
4. Sectiones transversales caulis.
5. Sectio transversalis ramuli.
- 6, 7. Folia caulina.
8. Folium ramulinum.
9. Apex ejusdem.
10. Areolatio ejusdem.
- 11, 12. Sectiones transversales ejusdem.
13. Calyptra styligera totam capsulam investiens cum archegoniis.
14. Capsula cum folio perichætiali.
15. Capsula deoperculata.
16. Sectio verticalis, apicem pseudopodii excavatam vaginulam hemisphæricam calyptræque basin ostendens.
17. Capsula operculata, calyptræ pars basilaris, pseudopodium et folia perichætialia.
18. Sectio verticalis figuræ 13, sporangium excavato-hemisphæricum et columnellam crassam exhibens.
19. Partes in sectione trans. calyptræ, operculi, et capsulæ parietorum.
20. Spora.

SPHAGNUM PORTORICENSE, *Hampe*.

Tab. 2.

PLANTÆ permagnæ, aquaticæ, molles, partibus junioribus emer-sisque glauco-viridibus, immersis pallide fusciscentibus.

CAULIS pedalis et longior, simplex vel bipartitus, crassiusculus, firmus, brunnescens, cortice spongioso triplici vel quadruplici e cellulis hyalinis spirali-fibrillosis vix porigeris formato obtectus: ramulis 4-5 in fasciculo, 2-3 julaceo-foliosis basi attenuatis clavæformibus erecto- vel arcuato-patentibus, cæteris gracilioribus longioribus laxioribus deflexo-dependentibus; cellulis strati corticalis simplicis geniculatis spiraliter fibrillosis parce porosis.

FOLIA basi appendiculata quasi stipulata; caulina subquadrato-ovata, erecta vel deflexa; cellulis hyalinis vix vel parcissime fibrilligeris sine ullis poris: ramulorum patulorum folia dorso ad apicem valde cucullatam squamoso-scabra, basilaria parvula semicircularia, cætera ampla basi brevissime angustata, media orbiculato-ovata, superiora late oblonga angustissime marginata, omnia (terminalibus exceptis) arcte imbricantia, toto ambitu (sicut caulina) eleganter fimbriata, fimbriis varie flexis e cellularum dissolutarum lineis commisuralibus (membrana plus minus destructa) compositis; cellulis hyalinis inferioribus elongato-rhomboidalibus ad latera intus papillis numerosis (fibrillis abortivis?) instructis, superioribus rhombeis, omnibus fibrillosis et porosis; cellulis chlorophyllosis ad folii faciem concavam positis, transversimque sectis triangularibus.

FLORES et fructus desiderantur.

SPHAGNUM PORTORICENSE, Hampe in Linnæa 1852, p. 359, e specimine originali auctoris!

SPHAGNUM SULLIVANTIANUM, Austin in Amer. Jour. Sci. 1863, p. 252.

HAB. Swamps on high mountains, Island of Porto Rico, West Indies, *Schwanecke*. Manchester Pond, Ocean County, New Jersey, *Austin*.

A very distinct species, in size and habit resembling large forms of *Sphagnum cymbifolium*; agreeing also with that species in the scabrous dorsal apex of the leaf, and in the presence of spiral fibrillæ in the cortical cells of the stem and branches, a structure found in no other *Sphagnum*.

The principal characters separating this species from *S. cymbifolium* are the attenuated base of the branches; the fringed margin, suddenly contracted base, and different cross-section of the leaf; the absence of pores in the cortical cells of the stem, and their rare occurrence in those of the branches; and, especially, the peculiar form of the latter cells, which are suddenly bent or sagged in the middle, so that in cross-sections of the branch they give the appearance of being disposed in two or three layers, instead of one, as is really the case, as shown in fig. 7, sections being made at the dotted lines *ab*, *cd*, and *ef*.

A distinctive character is also seen in the large hyaline cells near the base of the branch-leaf, which, within and along that portion of their walls in contact with the small chlorophyllose cells, are beset with papillæ or short spines (figures 11 and 12).

TAB. 2. — SPHAGNUM PORTORICENSE.

1. Planta *naturali magnitudine*.
2. Pars caulis cum ramulorum fasciculo.
3. Pars caulis transversim sectæ.
4. Folium caulinum.
5. Ramuli sectio transversalis.
6. Ramuli pars externa, cellularum corticalium formam lineis punctatis partim adumbrans.
7. Ejusdem sect. longitud. easdem cellulas in medio geniculatas monstrans.
8. Folium e ramuli medio desumptum.
9. Ejusdem apex a latere visa.
10. Ejusdem sectio transversalis.
11. Particula ejusdem sectionis, cellulas hyalinas intus papillosas exhibens.
12. Folii ramulini angulus basilaris, auriculas et cellulas hyalinas intus papillosas monstrans.
13. Cellulæ e folii ramulini media parte.
14. Eadem e parte superiore.
15. Folii particula cum cellulis partim dissolutis fimbriam formantibus.

SPHAGNUM HUMILE, *Schimp.*

Tab. 3.

PLANTÆ humiles, 1–5-unciales, robustiusculæ, in cæspitibus glaucescenti-viridibus inferne sordide albescensibus degentes.

CAULIS simplex vel bifurcatus, strato corticali triplici poris carente vestitus: ramulis 2–3 fasciculatis plus minus congestis squarroso-foliosis, 1–2 erecto-patentibus vel deflexis, cæteris gracilioribus pendulis; cellulis corticalibus stratum simplex formantibus elongatis, nonnullis apice leniter recurvo pertusis.

FOLIA caulina triangulari-ovata oblongave, erecta vel reflexa, apice eroso-dentata, parce porosa, fibrillis plerumque destituta: folia ramulorum majorum oblonga, acuminata, apice truncato denticulata, laxe incumbens, e basi ad medium erecta amplexante, dehinc squarrosa; apicalia stricta, lanceolato-subulata; omnia angustissime marginata; cellulis hyalinis latiusculis elongato-rhomboideis vel angulato-fusiformibus porosis fibrillosis; cellulis chlorophyllosis versus folii dorsum positae ibidemque submersae, transverse sectis cuneiformi-ellipticis.

FLORES dioici? masculi ignoti: feminei in caulis capitulo gemmæformes curvuli.

CAPSULA globosa exserta: perichætii raro dissoluti foliis superioribus elongato-oblongis sensim acuminatis late marginatis fibrillis porisque instructis.

SPHAGNUM HUMILE, Schimp. in schedis et in Gesch. d. Torfm. p. 80; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 14; Sulliv. Mosses U. States, p. 11.

SPHAGNUM COMPACTUM, Brid. & Müll. Synop. Musc. 1, p. 99.

HAB. Tallahassee, Florida, *Rugel*. Lookout Mountains, Alabama, *Lesquereux*. New Jersey, *James*, *Austin*.

The description and figure here given are from specimens collected in Florida by *Rugel*, and received from *Prof. Schimper* as his *Sphagnum humile*.

The species is perhaps too near the squarrose-leaved forms of *S. rigidum*, *Sch.* (*S. compactum*, *Brid.*), which abound in the Southern United States.

TAB. 3. — SPHAGNUM HUMILE.

1. Plantæ naturali magnitudine.
2. Pars caulis cum ramulorum fasciculo.
3. Sectio transversalis caulis.
4. Eadem ramuli.
5. Folium caulinum.
6. Idem et areolatio ejusdem.
- 7, 8. Folia media ramuli deflexi.
- 9, 10. Folia terminalia ejusdem.
11. Areolatio folii ramulini.
- 12, 13, 14. Sectiones transversales ejusdem.
15. Perichætium.
16. Idem dissolutum et capsula pseudopodio elata.
17. Folium perichætiale.
18. Areolatio ejusdem.
19. Apex ejusdem.
20. Capsula operculata cum calyptræ residuo.
21. Opereulum et spora.

SPHAGNUM MOLLE, *Sulliv.*

Tab. 4.

PLANTÆ tenellæ, delicatulæ, dense cæspitosæ, e viridulo albescentes vel dilutissime fuscescentes.

CAULIS subindivisus, 2–3-uncialis, strato corticali duplici indutus, confertissime ramulosus: ramulis 2–3 fasciculatis subconsimilibus erecto-patentibus; cellulis corticalibus in strato simplici dispositis inæqualibus, majoribus elongatis apice recurvulo truncato apertis.

FOLIA caulina approximata, ampla, oblonga, obtusa, patentia et deflexa; cellulis hyalinis haud vel parce spiriferis: folia ramulina tenerrima, oblongo-ovata, recta vel recurvula, superne convoluta, apice truncato denticulata, angustissime marginata; cellulis hyalinis latiuscule angulato-fusiformibus, poris et fibrillis haud numerosis; cellulis chlorophyllosis tenuissimis, ad concavam folii faciem emersis inque sectione transversali triangularibus.

FLORES dioici: antheridia secus ramulos proprios erectos breves disposita, subglobosa, longe pedicellata, perigonalibus lateralibus; paraphysibus filiformibus ramosis.

CAPSULA globosa, in caulis capitulo emersa: perichætium haud dissolutum; folia superiora late oblongo-ovata, convoluta, summo apice 2–3-dentato constricta; rete inferne prosenchymaticum, elongato-hexagono-rhomboideum e cellulis homomorphis exstructum, superne sphagnoideum; poris atque fibrillis omnino nullis.

SPHAGNUM MOLLE, *Sulliv. Musc. Alleghan. No. 205; Mosses U. States, p. 13; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 16.*

SPHAGNUM TABULARE, *Sulliv. Musc. Alleghan. No. 204; Mosses U. States, p. 12, pro parte.*

SPHAGNUM COMPACTUM & var., *Brid. e Müll. Synop. Musc. 2, p. 539.*

HAB. Table Mountain, North Carolina, *Gray*. Tallulah Falls, Georgia, *Lesquereux*. Quaker Bridge, New Jersey, *James*, *Austin*.

Sphagnum molle in general aspect resembles *S. molluscum*. The two differ however as follows: — the chlorophyllose cells of the ramuline leaves of both species are triangular in cross-section: in the first they are situated at the concave, and in the second at the convex surface of the leaf. Furthermore, there is a striking difference in their perichætial leaves; those of *S. molle* being entirely destitute of fibrillæ, and, in their lower half, composed wholly of homomorphous cells.

TAB. 4. — SPHAGNUM MOLLE.

1. Plantæ fem. et masc. *naturali magnitudine*.
2. Planta juvenilis e spora enata.
3. Pars caulis cum foliis.
4. Sectio transversalis caulis.
5. Folium ramulinum.
6. Pars ramuli, cellulas majores corticales apice recurvo pertusos ostendens.
7. Sectio transversalis ramuli cum folii basi.
8. Areolatio folii ramulini.
- 9, 10. Sectio transversalis folii ramulini.
11. Capsula, pseudopodium, et folia perichætialia.
12. Folium perichætii.
- 13, 14, 15. Areolatio apicalis media et basilaris ejusdem.
16. Ramulus erectus antheridiophorus.
17. Apex ejusdem.
18. Antheridium et folium perigoniale.
19. Antheridium cum pedicello paraphysibus ramosis obsito.
20. Paraphyses ramosæ.

SPHAGNUM [MÜLLERI, *Schimp.*

Tab. 5.

PLANTÆ delicatulae, viridulae vel sordide albescences, raro colore dilute purpurascente tinctae.

CAULIS 1–4-uncialis, tenuis; strato tegmentario duplici: ramuli 3–4-fasciculati, in plantis humilioribus erecto-patentes condensati, in elatioribus 1–2 arcuato-deflexi, caeteri graciliores, flagelliformes, penduli; cellulis corticalibus elongatis in strato unico dispositis, illis porigeris apice lenissime recurvis.

FOLIA caulina magna, oblongo- vel obovato-lanceolata; cellulis hyalinis spirigeris et porosis: folia ramulina e basi ad medium amplexicaulia erecta, dehinc squarrosa, ex oblongo lanceolata, superne involuto-concava, margine crenato angustissimo, apice (ut in caulinis) plus minus grosse dentato; cellulis hyalinis angulato-serpentinis fibrillis porisque instructis; cellulis chlorophyllosis situ sectioneque transversali speciei praecedentis.

FLORES monoici: amentula mascula brevia, crassiuscula, violacea, in ramulis comalibus et horizontalibus (numquam in dependentibus) posita.

CAPSULA terminalis, globosa, emersa: folia perichætialia laxiuscula, curvula, oblongo-lanceolata, acuminata, limbo lato versus apicem irregulariter dentatam sensim latiore circumducta; cellulis hyalinis ad folii partem superiorem fibrillis et poris instructis, ad inferiorem carentibus: sporae sulphureae.

SPHAGNUM MÜLLERI, Schimp. *Gesch. d. Torfm.* p. 73, t. 26, *Synop. Musc. Europ.* p. 686.

SPHAGNUM MOLLUSCOIDES, Müll. *Synop. Musc.* 2, p. 539.

SPHAGNUM ACUTIFOLIUM var. ? *Sulliv. Musc. Alleghan.* No. 203. (1845.)

SPHAGNUM TABULARE, *Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc.* (ed. 1), No. 15; *Sulliv. Mosses U. States*, p. 12, pro parte.

HAB. Mobile, Alabama, *Sullivant*. Lookout Mountains, Alabama, *Lesquereux*. Mountains of North Carolina, *Curtis*, *Buckley*. Santee Canal, South Carolina, *Ravenel*. Green County, Mississippi, *Tice*.

Approaches *S. molle*, but is distinguished by its squarrose ramuline leaves, and the very different cell-structure of its longer-pointed perichæatial leaves.

TAB. 5. — SPHAGNUM MÜLLERI.

- 1, 2. Plantæ naturali magnitudine.
3. Pars caulis cum ramulorum fasciculo.
4. Folium caulinum.
5. Folium ramuli.
6. Apex ejusdem.
7. Particula folii ramulini, areolationem et marginem crenatam monstrans.
8. Sectio transversalis ejusdem.
9. Sectio transversalis caulis.
10. Particulæ ramuli in sectione transversali et a latere visæ.
11. Perichætium pseudopodium, opereulum et capsula, cum calyptræ vestigio.
12. Folium perichætiale.
13. Apices ejusdem.

SPHAGNUM SEDOIDES, *Brid.*

Tab. 6.

PLANTÆ laxæ cæspitantes, prostratæ, flaccidæ, vermiculiformes, e olivaceo-viridi triste rubentes.

CAULIS subtriunciales et ultra, $\frac{1}{10}$ unc. diametro metiens, debilis, simplex vel raro apice divisus, julaceo-foliosus, strato corticali simplici vestitus; ramulis singulis sparsis brevissimis (illis apicem caulis versus longioribus) intra foliorum caulinarum axillas fere reconditis.

FOLIA caulina conferte imbricantia, oblongo-ovata, valde concava, apice obtuso integerrima vel eroso-denticulata, serie duplici cellularum valde exilium circumeincta; cellulis hyalinis elongatis annulari-fibrillosis post exsiccationem aquam ægre assurgentibus, poris paucissimis vix ullis; cellulis chlorophyllosis (quam solito crassioribus) ad utramque folii faciem emergentibus inque sectione transversali quadrato-triangularibus: folia ramulina caulinis multo minora, cæterum non aliter constructa.

FLORES et fructus ignoti.

SPHAGNUM SEDOIDES, *Brid.* Bryol. Univ. 1, p. 750; *Sulliv.* Musc. Alleghan. No. 208, Mosses U. States, p. 12; *Sulliv. & Lesqx.* Musc. Bor.-Amer. Exsicc. (ed. 1), No. 4.

SPHAGNUM CYMBIFOLIUM, forma juvenilis, *Müll.* Synop. Musc. 1, p. 92.

HAB. Newfoundland, *La Pylaie*. Mount Marcy, New York, *Torrey*. Table Rock, South Carolina, *Gray*, *Lesquereux*.

TAB. 6. — SPHAGNUM SEDOIDES.

1. Plantæ naturali magnitudine.
- 2, 3. Partes caulis et ramuli.
- 4, 5. Folia.
6. Apex folii.
- 7, 9. Sectiones transversales folii.
8. Areolatio folii.
10. Sectio transversalis caulis.

SPHAGNUM PYLÆSII, *Brid.*

Tab. 6.

FORTE idem ac præcedens; non aliter diversum quam colore sæpe in atro-viridum transeunte, caule graciliore longiore (in ipsa aqua interdum 8–12-unciali) dissitius folioso, ramulisque magis evolutis deorsum curvatis. Flores et fructus desunt.

SPHAGNUM PYLÆSII, Brid. Bryol. Univ. 1, p. 750.

SPHAGNUM SEDOIDES var., Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 4; Sulliv. Mosses U. States, p. 12.

SPHAGNUM CYMBIFOLIUM, forma juvenilis, Müll. Synop. Musc. 1, p. 92.

HAB. Newfoundland, *La Pylaie*. Table Rock Mountain, South Carolina, *Gray*, *Lesquereux*. Willey Mountain, New Hampshire, *James*. New Jersey, *Austin*.

See remarks respecting this and *S. sedoides* under *S. cyclophyllum*.

TAB. 6.—SPHAGNUM PYLÆSII.

1. Plantæ naturali magnitudine.
2. Pars caulis cum ramulo.
3. Folia caulina.
4. Apex folii.
5. 6. Sectiones transversalis folii.
7. Areolatio ejusdem.
8. Folium ramuli.
9. Sectio transversalis caulis.

SPIIAGNUM CYCLOPHYLLUM, *Sulliv. et Lesqx.*

Tab. 6.

PLANTÆ robustiores, turgide vermiculiformes, procumbentes: cæspites laxi, molles, glauco-virides pallide flavescentes vel fusco-rubentes.

CAULIS 2-4-uncialis et ultra, $\frac{1}{3}$ unc. diametro excedens, compresso-julaceus, ut plurimum simplex, interdum uno alterove ramo instructus, debilis, flexuosus: stratum tegmentarium simplex.

FOLIA pro caulis ratione amplissima, expansa orbiculari-ovata, imbricantia, flaccidissima, apice integerrima, basi contracta, cellulis exilissimis biserialibus marginata; cellulis hyalinis elongatis flexuosis fibrilliferis, poris numerosis minutis ad latera positis. Sectio transversalis folii ut in præcedente.

FLORES et fructus ignoti.

SPHAGNUM CYCLOPHYLLUM, Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 5; Sulliv. Mosses U. States, p. 11.

SPHAGNUM CYMBIFOLIUM var., Hook. & Wils. in Drum. Musc. Amer. Coll. 2, No. 17.

HAB. New Orleans, *Drummond*. Mountains of Alabama, *Lesquereux*. New Jersey, *James*, *Austin*.

S. cyclophyllum, *S. sedoides*, and *S. Pylæsii* are doubtless young or rudimentary forms of one or more species which are either unknown, or, if known, not yet recognized as the above plants in their fully developed state. Their close relationship to the protean *S. subsecundum* (which already, in the case of *S. sedoides*, has been noticed by *Wilson*, *Bryol. Brit.*) is suggested by their color, varying through different shades of glaucous, olive-green, pale yellow, vinous red, and brownish black, and by the texture, and, to a certain extent, the shape of their leaves. The almost entire absence of pores in *S. sedoides* and

S. Pylæsii, and, on the other hand, the presence of numerous and minute ones in the hyaline leaf-cells of *S. cyclophyllum*, do not oppose this view, the same diversity occurring in complete forms of *S. subsecundum*.

They have been referred to *S. cymbifolium*, but the cortical cells of their stems and branches are destitute of fibrillæ, and their leaves are not papillose on the dorsal apex.

TAB. 6. — SPHAGNUM CYCLOPHYLLUM.

1. Plantæ naturali magnitudine.
2. Pars caulis foliosi.
- 3, 4. Folia.
5. Apex folii.
6. Sectio transversalis folii.
7. Areolatio folii.
8. Caulis transversim sectus.

The following are all the species of *Sphagnum* at present known to occur in North America, together with their principal synonymes.

1. *S. ACUTIFOLIUM*, Ehrh.; Schimp. Gesch. d. Torfm. p. 56, t. 13 & 14; *S. capillifolium* Hedw.; *S. tenerum*, Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 11; Sulliv. Mosses U. States, p. 11. — Bogs, common.
2. *S. FIMBRIATUM*, Wils. in Hook. & Wils. Musc. Antaret. p. 92; Bryol. Brit. p. 21; Schimp. Gesch. d. Torfm. p. 59, t. 15. — British America, and Northern U. States.
3. *S. MOLLE*, Sulliv. Musc. Alleghan. No. 205, Mosses U. States, p. 13, Icones Musc. p. 7, t. 4; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 16; *S. tabulare*, Sulliv. Musc. Alleghan. No. 204, Mosses U. States, p. 12, partly; *S. compactum* ♂ var. Bröd. e Müll. Synop. Musc. 2, p. 539. — Georgia to New Jersey.
4. *S. MÜLLERI*, Schimp. Gesch. d. Torfm. p. 73, t. 26; *S. molluscoides*, Müll. Synop. Musc. 1, p. 99; *S. acutifolium*, var.? Sulliv. Musc. Alleghan. No. 203; *S. tabulare*, Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 15; Sulliv. Mosses U. States, p. 12, partly, Icones Musc. p. 9, t. 5. — Southern States.
5. *S. PORTORICENSE*, Hampe in Linnæa, 1852, p. 359; *S. Sullivantianum*, Austin, in Amer. Jour. Art. & Sci., 1863, p. 252; Sulliv. Icones Musc. p. 2, t. 2. — Porto Rico, West Indies. Ponds, New Jersey.

6. *S. CUSPIDATUM*, Ehrh.; Schimp. Gesch. d. Torfm. p. 60, t. 16. Subject to many marked varieties, among which are *S. recurvum*, Beauv.; *S. laxifolium*, C. Müll.; *S. flexuosum*, D. & M.; *S. Torreyanum*, Sulliv.; *S. Mougeotii*, Schimp.; etc. — Swamps and ponds, mostly Southern.

7. *S. LINDBERGHII*, Schimp. Gesch. d. Torfm. p. 67, t. 25; *S. cuspidatum*, Lind. in Bot. Not., 1856, p. 122. — Found in Canada by Drummond according to Schimper, l. c.

8. *S. MOLLUSCUM*, Bruch.; Schimp. Gesch. d. Torfm. p. 71, t. 21. — Ponds, New Jersey, *Austin*.

9. *S. CYMBIFOLIUM*, Ehrh.; Schimp. Gesch. d. Torfm. p. 69, t. 19; *S. latifolium*, Hedw.; *S. obtusifolium*, H. & T.; *S. compactum*, Brid. partly. — Bogs and swamps, common.

10. *S. RIGIDUM*, Nees; Schimp. Gesch. d. Torfm. p. 65, t. 18; *S. compactum*, Wils. not Brid.; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 12 & 13; *S. strictum*, Sulliv. Musc. Alleghan. No. 201. — Bogs, Southern States.

11. *S. HUMILE*, Schimp. Gesch. d. Torfm. p. 80; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 14; Sulliv. Mosses U. States, p. 11, Icones Musc. p. 5, t. 3. — Florida. Probably a form of the last species.

12. *S. SUBSECUNDUM*, Nees; Schimp. Gesch. d. Torfm. p. 74, t. 22 & 23; *S. contortum*, auct.; *S. obesum*, Wils.; *S. Lescurii*, Sulliv.; *S. auriculatum*, Schimp. op. cit. p. 77, t. 24. — Northern Ohio and Atlantic States.

13. *S. SQUARROSUM*, Pers.; Schimp. Gesch. d. Torfm. p. 63, t. 17. — Northern and Middle States.

14. *S. MACROPHYLLUM*, Bernh. in Brid. Bryol. 1, p. 10; Sulliv. Musc. Alleghan. No. 27, Icones Musc. p. 10, t. 1. — Swamps, Florida to New Jersey.

15. *S. SEDOIDES*, Brid. Bryol. Univ. 1, p. 750; Sulliv. Musc. Alleghan. No. 208, Icones Musc. p. 11, t. 6. — Bogs, mountainous districts.

16. *S. PYLÆSI*, Brid. Bryol. Univ. p. 749; Sulliv. Icones Musc. p. 12, t. 6. — Same locality as the last; also ponds, New Jersey. — Probably not specifically distinct from the preceding.

17. *S. CYCLOPHYLLUM*, Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 5; Sulliv. Icones Musc. p. 13, t. 6. — Swamps, Florida to New Jersey.

ARCHIDIUM OHIOENSE, *Schimp.*

Tab. 7.

PLANTÆ perennes, gregariæ vel laxe cæspitosæ, filiformes, sordide virides.

CAULIS 3–10-linearis, primo simplex erectus, dein semel bisve innovando-ramosus prostratus, gracilis, flagelliformis.

FOLIA patentia, lanceolato-subulata, pellucide ample oblongo-areolata, apice serrulata, costa valida continua: perichætalia caulinis majora, lato-lanceolata, longe acuminata, costata.

FLORES monoici: masculi gemmiformes cauligeni; perigonialibus 3–5 late ovatis acutis; antheridiis 3–6.

CAPSULA terminalis vel innovatione lateralis, globosa, immersa, sessilis, leptoderma: calyptra minuta, lacero-submitriformis. Sporæ 16–20, maximæ, angulosæ, læves.

ARCHIDIUM OHIOENSE, Schimp.; Müll. Synop. 2, p. 517; Sulliv. Mosses U. States, p. 14; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 28. ARCHIDIUM PHASCOIDES, Sulliv. Musc. Alleghan. No. 213.

HAB. Meadows and waste fields, Ohio and Alabama.

Differs from the European *Archidium phascoides* mainly in its male flower, which is gemmiform and differently situated.

TAB. 7. — ARCHIDIUM OHIOENSE.

1. Plantæ naturali magnitudine.
2. Plantæ fertiles.
- 3, 4, 5. Folia caulina.
6. Folium caulinum areolationem exhibens.
- 7, 8, 9. Perichætia, capsulas includentia.
10. Folia perichætalia.
- 11, 12. Capsulæ.
13. Capsula verticaliter secta.
- 14, 15. Sporæ.
- 16, 17. Perigonia.
- 18, 19. Antheridia et perigonia.

EPHEMERUM CRASSINERVIUM, (*Schwægr.*) *Hampe.*

Tab. 8.

PLANTÆ annuæ, minimæ, subacaules, gregariæ, in prothallio byssoideo persistente nidulantes.

CAULIS brevissimus, erectus, simplex, congesto-foliosus, basi radiculosus.

FOLIA 10–12, e basi lanceolata subulata, flexuoso-erecta, rigida, capsulam longe superantia, laxè elongato-rhomboideo-arco-lata, superne papillosa, apicem versus costæque dorso plus minus grosse serrata vel irregulariter dentata; costa basi haud raro subevanida cum apice desinente.

FLORES dioici: planta mascula gemmiformis, 3–5-phylla, ad feminei basin sessilis; antheridiis 2–3.

CAPSULA immersa, sphærica, mammillata, in pedicello brevissimo; calyptra dimidiato-mitriformis, basi parce lacera; columella fugacissima; sporis majusculis subrotundis papillois.

EPHEMERUM CRASSINERVIUM, Müll. Synop. Musc. 1, p. 33.

PHASCUM CRASSINERVIUM, Schwægr. Suppl. t. 2; Sulliv. Musc. Alleghan. No. 209, Mosses United States, p. 14.

HAB. Moist clayey ground, roadsides, river-banks, &c.

A very variable species: leaves more or less papillose on both surfaces, their margins slightly serrate or spinulose and runcinate-dentate. The typical form here figured is readily connected by intermediates with *E. spinulosum*, *Br. & Sch.*

TAB. 8.—EPHEMERUM CRASSINERVIUM.

- | | |
|-----------------------------------|-------------------------------|
| 1. Plantæ naturali magnitudine. | 13. Eadem verticaliter secta. |
| 2, 3, 4. Plantæ. | 14. Spora. |
| 5, 6, 7, 8. Folia. | 15, 16. Calyptræ. |
| 9. Folium areolationem monstrans. | 17. Flos masculus. |
| 10. Capsula cum perigoniali. | 18. Folium perigoniale. |
| 11. Capsula calyptrata. | 19. Antheridia. |
| 12. Capsula. | |

ACAULON SCHIMPERIANUM, *Sulliv.*

Tab. 9.

PLANTÆ humillimæ, annuæ, sparsæ vel subgregariæ, ovoideo-bulbiformes.

CAULIS brevissimus, simplex, 10–12-phyllus, basi radiculis longis copiose instructus.

FOLIA arete imbricata, superiora inferioribus ecostatis multo majora, obovato-lanceolata, valde cymbiformi-concava, apice recurva, ibidemque utraque pagina papillosa, marginibus superne recurvis eroso-dentata, laxè rhomboideo-areolata, costa valida statim infra folii apicem oriente longius excedente cuspidata.

FLORES dioici: planta mascula minima, gemmacea, ad plantæ fructiferæ pedem sita, 3–4-phylla; antheridiis 2–3 eparaphysatis.

CAPSULA globosa, submutica, recondita, horizontalis, tenui-membranacea, aurantiacea; pedicello longiusculo cygneo; calyptra conico-mitriformi minutissima.

ACAULON SCHIMPERIANUM, *Sulliv.* Mosses U. States, p. 15, *Sulliv. & Lesqx.* Musc. Bor.-Amer. Exsicc. (ed. 1), No. 26.

HAB. San Marcos, Texas, *Wright.* Athens, Illinois, *Hall.*

This species is distinguished by its papillose leaves destitute of a costa except at their recurved apices.

TAB. 9. — ACAULON SCHIMPERIANUM.

- | | |
|---|----------------------------------|
| 1. Plantæ naturali magnitudine. | 11, 12. Plantæ foliis exsectis. |
| 2. Fructifera cum gemma mascula. | 13. Capsula disrupta cum sporis. |
| 3, 4, 5, 6. Folia. | 14. Spora. |
| 7. Sectio transversalis folii. | 15. Calyptra stylogera. |
| 8. Pars folii areolationem demonstrans. | 16. Gemma mascula. |
| 9. Areolatio folii baseos. | 17. Folium perigoniale. |
| 10. Capsula cum fol. perichætiali. | 18. Antheridia. |

PLEURIDIUM NERVOSUM, (*Hook.*) *Brid.*

Tab. 10.

PLANTÆ gregariæ, humiles, graciles, parce innovando-ramosæ.

CAULIS erectus, 3–6 lineas altus, tenuis, rigidiusculus, inferne julaceo-foliosus.

FOLIA erecto-appressa, arcte imbricantia, oblongo-ovata, acuta, ascendendo accrescentia; comalia vel perichætalia multo majora, aperta, oblonga; subito longe cuspidata; omnia costa valida percurrente instructa; areolatione superne e cellulis crassis opacis rhomboidalibus, inferne majoribus laxis oblongis.

FLORES monoici: masculi gemmæformes, cauligeni, sessiles; perigonalibus 3–5 ovato-lanceolatis ecostatis; antheridiis 3–5 paraphysatis.

CAPSULA elliptico-ovalis, immersa, brevissime pedicellata; calyptra cucullata brevi lata, basi incisa.

PHASCUM NERVOSUM, Hook. Musc. Exot. t. 105; Drum. Musc. Amer. Coll. 2, No. 6; Sulliv. Mosses U. States, p. 16.

HAB. Pennsylvania, *Drummond.*

Established originally by Hooker on specimens from the Cape of Good Hope. It is also a native of New Zealand, Chili, and the island of Juan Fernandez.

TAB. 10. — PLEURIDIUM NERVOSUM.

- | | |
|-------------------------------------|--|
| 1. Plantæ naturali magnitudine. | 12. Capsula calyptrata cum fol. perichæt. |
| 2. Planta fructifera. | 13. Capsulæ. |
| 3. Caulis defoliatus cum fl. masc. | 14. Sectio verticalis capsulæ. |
| 4, 5, 6. Fol. perichæt. et comalia. | 15. Calyptra. |
| 7. Folium caulis medii. | 16. Flores masculi. |
| 8, 9, 10. Areolatio folii. | 17. Perigonalia, antheridium, et paraphysis. |
| 11. Folii sectio transversalis. | |

ASTOMUM SULLIVANTII, (*Schimp.*) *Hampe.*

Tab. 11.

DIFFERT ab *A. crispo* cui simillimum, habitu humiliore, capsulæque nitidulæ longius rostellate cellulis perbelle aurantiaceis.

ASTOMUM SULLIVANTII, Schimp. Bryol. Europ.

PHASCUM CRISPUM, Sulliv. Musc. Alleghan. No. 211, ex parte.

HAB. Waste fields, roadsides, &c. — Common.

The bright orange-colored cells of the capsule-wall furnish the main distinctive mark of this species. In other respects, it is scarcely to be separated from *A. crispum*, with which it is often found growing, as also with another very nearly related species, *A. nitidulum*, *Schimp.* l. c. The last is a smaller species than *A. Sullivantii*, and has an ovoid chestnut-colored, glossy capsule, obliquely rostellate, with a much longer pedicel and a smaller calyptra. In the two last-named species, as in *A. crispum* and *A. Ludovicianum*, a feeble operculum prevails, their fully matured capsules under slight pressure dehiscing by a circumscissile line near the apex; hence an operculated genus, *Systegium*, has recently and very properly been established for these species by Professor Schimper.

TAB. 11.—ASTOMUM SULLIVANTII.

- | | |
|----------------------------------|---|
| 1. Plantæ naturali magnitudine. | 11, 12, 13, 14. Capsulæ. |
| 2. Planta fructifera. | 15. Capsula verticaliter secta. |
| 3. Eadem defoliata cum fl. masc. | 16. Capsula calyptrata cum foliis perichætalibus. |
| 4, 5, 6. Folia comalia. | 17, 18. Calyptræ. |
| 7. Pars folii. | 19. Spora. |
| 8. Rete folii baseos. | 20. Flos masculus. |
| 9, 10. Sectiones trans. folii. | |

ASTOMUM LUDOVICIANUM, *Sulliv.*

Tab. 12.

Astomo crispo peraffine ; distat tamen statura majore, habitu ramosiori, capsulis numerosioribus sæpe 2-3 ex eodem perichætio, pedicellis longioribus : ab *A. multicapsulari* foliis firmioribus haud flaccidis marginibus involutis, ab *A. Mittenii* caule ramosissimo foliis haud planis perichætio polyphylo, distinctum : ab omnibus statim dignoscitur capsulis oblongo-ovalibus breviter obtuse apiculatis.

PHASCUM LUDOVICIANUM, *Sulliv. Mosses U. States*, p. 16.

PHASCUM CRISPUM, var. ROSTELLATUM? *Hook. & Wils. in Drum. Musc. Amer. Coll. 2, No. 10.*

HAB. New Orleans, Louisiana, *Drummond.* Florida, *Chapman.*

TAB. 12. — ASTOMUM LUDOVICIANUM.

1. Plantæ naturali magnitudine.
2. Pars plantæ capsuliferæ.
3. Pars plantæ defoliatæ, florem masculum et capsulas exhibens.
- 4, 5. Folia.
6. Partes foliorum.
- 7, 8. Sectiones transversales foliorum.
9. Areolatio folii baseos.
- 10, 11, 12. Capsulæ.
13. Capsula verticaliter secta.
14. Calyptra.
15. Spora.
16. Perigoniale, antheridium, et paraphysis.

BRUCHIA FLEXUOSA, *Schwægr.*

Tab. 13.

PLANTÆ humiles, densius gregariæ vel sparsæ, viridi-flavescentes.

CAULIS 3–6-linearis, subsimplex, gracilis, flexuosus, basi radiculosus.

FOLIA inferiora erecto-appressa, lineari-lanceolata; superiora sensim majora, patenti-incurva, e basi lata concava erecta, laxius oblongo-areolata, in subulam longissimam canaliculatam densius areolatam apice obscure denticulatam attenuata; costa inferne lata cum apice desinente.

FLORES monoici: masculi 2–3-phylli in ramulis brevibus propriis terminales; perigonalibus elongatis; antheridiis 3–5, paraphysibus nullis.

CAPSULA una cum collo solido magno oblongo-obovata, rostrata, in pedicello plus minus longo flexuoso elata; calyptra mitræformi basi lobata ad tertiam partem capsulæ vel ultra descendente; sporis luteis papillulosis circa diametro $\frac{1}{650}$ uncix metientibus.

PHASCUM FLEXUOSUM, Schwægr. Suppl. t. 101.

BRUCHIA FLEXUOSA, C. Müll.; Sulliv. Mosses U. States, p. 17; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 32.

BRUCHIA VOGESIACA, var., Hook. & Wils. pro parte, in Drum. Musc. Amer. Coll. 2, No. 15.

VAR. NIGRESCENS; caule longiore, capsula subfusiformi, foliis brevioribus appressis, sporis paullulum majoribus atro-fuscis.

HAB. On moist exposed ground, Florida to New England, and west to Pennsylvania and Ohio. The var., Raccoon Mountains, Alabama, *Lesquereux*.

The European *Bruchia Vogesiaca*, which this species resembles, is a larger moss, with a more elongated capsule gradually tapering below into the pedicel, and above into a long and slender beak. Its spores are much smaller, being only $\frac{1}{1000}$ of an inch in diameter.

TAB. 13. — BRUCHIA FLEXUOSA.

1. Plantæ naturali magnitudine.
- 2, 3, 4. Plantæ.
- 5, 6. Folia.
7. Areolatio folii apicis.
8. Eadem folii baseos.
9. Sectio transversalis folii.
10. Capsula, pedicellus, et vaginula cum paraphysibus.
11. Calyptra.
12. Antheridia cum folio perigonalibus.

BRUCHIA BREVIPES, *Hook.*

Tab. 14.

Cum formis *Bruchiæ flexuosæ* humilioribus proximis sæpe commutata; distincta tamen foliis rigidioribus e basi latiore teneriore subito in subulam longiorem graciliorem totam costa impletam productis, capsulamque breviorē pyriformem basi truncatam acute apiculatam longe superantibus, et sporis majoribus diametro $\frac{1}{450}$ unciae metientibus.

BRUCHIA BREVIPES, Hook. Ic. Pl. Rar. 3, t. 231; Hook. & Wils. in Drum. Musc. Amer. coll. 2, No. 15, pro parte.

BRUCHIA VOGESIACA, β . MINOR, Müll. Synop. 1, p. 20.

HAB. Louisiana, *Drummond.* South Carolina, *Ravenel.*

Not having seen Cape of Good Hope specimens, on which *B. brevipes* was established, Hooker's figure and Drummond's specimens, above cited, were relied on for the identification of our moss with that of the Cape.

According to original specimens from Hampe, *Sporledera Beyrichiana* (Müll. Synop. 1, p. 18) is *Bruchia brevipes* in an immature state: Schwægrichen's Tab. 301 appears to be *Bruchia flexuosa* in a similar state.

TAB. 14. — BRUCHIA BREVIPES.

1. Plantæ naturali magnitudine.
- 2, 3, 4. Plantæ.
- 5, 6, 7. Folia.
8. Apex folii.
9. Basis folii.
- 10, 11, 12. Capsulæ.
13. Capsula verticaliter secta.
14. Calyptra.
15. Spora.
16. Flos masculus, antheridium, et folium perigoniale.

BRUCHIA BREVIFOLIA, *Sulliv.*

Tab. 15.

PLANTÆ perhumiles, cæspitulosæ, basi radiculis instructæ.

CAULIS brevissimus, subsimplex, erectus, dense foliosus.

FOLIA congesta; inferiora minuta, ovata et ovato-acuminata; superiora majora, vix mediam capsulam attingentia, late ovata, amplexantia, in acumen latum ejusdem longitudinis subitius producta; cellulis inferne oblongis laxis, superne subquadratis densis; costa lata complanata ad apicem perdurante.

FLORES monoici: masculi gemmacei, polyphylli, terminales.

CAPSULA pro plantæ exiguitate permagna, obovato-oblonga, basi truncata, subito apiculata pedicello perbrevis; calyptra mitræformi basi lobata; vix tertiam capsulæ partem obtegente; sporis luteolis scrobiculatis diametro $\frac{1}{1000}$ unciae metientibus.

BRUCHIA BREVIFOLIA, Sulliv. Mosses U. States, p. 17.

BRUCHIA VOGESIACA var., Hook. & Wils., op. cit., No. 15, partim.

HAB. Louisiana, *Drummond.* South Carolina, *Ravenel.* Texas, *Wright.*

The broad, short leaves, the capsules very large for the size of the plant, and the spores minutely pitted (not papillose, as is usual in the genus), furnish decided characters for this species.

TAB. 15. — BRUCHIA BREVIFOLIA.

1. Plantæ *naturali magnitudine.*
- 2, 3, 4. Plantæ.
- 5, 6. Folia.
- 7, 8. Areolatio folii apicis et baseos.
- 9, 10. Capsulæ.
11. Sectio verticalis capsulæ.
- 12, 14. Sporæ et calyptra.
- 15, 16. Flores masculi.
17. Folium, perigoniale, et antheridium.

BRUCHIA RAVENELII, *Wils.*

Tab. 16.

PLANTÆ generis minimæ, sparsæ vel in cæspitulos aggregatæ.

CAULIS brevissimus, simplex, condensato-foliosus.

FOLIA infima minutissima, media lineari-lanceolata erecta, summa multo majora patentia, capsulam longe superantia, e lanceolato sensim angustata, apice grossius dentata; reti inferiore laxo oblongo, superiore denso quadrato; costa lata percurrente.

FLORES monoici: masculi in ramulis basilaribus terminales; perigonalibus elongato-lanceolatis.

CAPSULA vix emersa, una cum collo lato brevi obovata vel ovali-pyriformis, in pedicellum perbreve abrupte continua, brevissime apiculata; calyptra mitræformi pluriloba papillis copiose conspersa; sporis luteolis papillulosis circa diametro $\frac{1}{430}$ unc. metientibus.

BRUCHIA RAVENELII, Wils. in litt. ad Ravenel; Sulliv. Mosses U. States, p. 17; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 33.

HAB. Banks of the Santee Canal, South Carolina, *Ravenel*.

The papillose calyptra is the leading character of this species.

TAB. 16. — BRUCHIA RAVENELII.

- 1, 2. Plantæ *naturali magnitudine*.
- 3, 4, 5, 6. Plantæ.
7. Capsula cum perichæatiali.
8. Folia comalia.
9. Folia perichæatialia.
10. Areolatio folii baseos.
11. Eadem folii apicis.
- 12, 13. Calyptræ.
14. Spora.
15. Flos masculus.
16. Folia perigonalia.
17. Antheridium.

CAMPYLOPUS TALLULENSIS, *Sulliv. & Lesqx.*

Tab. 17.

PLANTÆ 1–2-unciales, cæspites latos laxiusculos efficientes, e viridi flavescentes, nitidæ, inferne fuscæ.

CAULIS simplex vel dichotomus, dense foliosus, inferne radiculis instructus.

FOLIA erecto-patentia, e basi angusto-lanceolata sensim longe subulata, canaliculato-concava, summo apice serrata, dorso lævia, densius oblongo-areolata; cellulis angularibus permagnis laxis pallide fuscis; costa latissima percurrente.

FLORES et fructus desunt.

CAMPYLOPUS TALLULENSIS, Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 73^b.

HAB. Moist rocks, Tallulah Falls, Georgia, *Lesquereux*.

TAB. 17, A. — CAMPYLOPUS TALLULENSIS.

1. Planta naturali magnitudine.
2. Pars plantæ.
- 3, 4. Folia.
5. Areolatio folii baseos.
- 6, 7, 8, 9. Sectiones transversales folii.
10. Areolatio folii apicis.

CAMPYLOPUS LEUCOTRICHUS, *Sulliv. & Lesq.*

Tab. 17.

PLANTÆ laxius cæspitosæ, unciales et ultra, rigidiusculæ, nitidulæ, flavescenti-virides, inferne fuscæ.

CAULIS erecto-ascendens, ad apicem usque radiculosus, innovando-ramosus ; ramis gracilibus apice comoso-foliosis.

FOLIA conferta, erecto-patentia, e basi angusta lanceolata sensim longe attenuata, in pilum longiusculum hyalinum grosse dentatum desinentia, minutissime subquadrato-areolata ; cellulis basilaribus amplis laxis aurantiaceis ; costa latissima percurrente dorso lamellosa.

FLORES et fructus ignoti.

CAMPYLOPUS LEUCOTRICHUS, Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 73.

HAB. Dry, sandy rocks, Raccoon Mountains, Alabama, *Lesqueroux*.

TAB. 17, B. — CAMPYLOPUS LEUCOTRICHUS.

1. Plantæ *naturali magnitudine*.
2. Pars caulis.
- 3, 4. Folia.
5. Rete folii baseos.
- 6, 7, 8. Sectiones transversales folii.
9. Pilum hyalinum folii.



CAMPYLOPUS LEANUS, *Sulliv.*

Tab. 18.

PLANTÆ 6–10-lineares, compacte cæspitosæ, glauco-virides, inferne albido-ochraceæ.

CAULIS erectus, tenuis, ad apicem usque dense radiculosus, innovationibus fastigiato-ramosus.

FOLIA conferta, erecto-patentia vel subsecunda, e basi angustolanceolata subulata, canaliculato-concava, fere costa omnino impleta: folia abortiva minuta, numerosissima, elliptica, oblonga vel linearia, carnosiuscula, ad caulis ramorumque apicem pluries divisam in capitulis conspicuis condensata.

FLORES et fructus haud noti.

CAMPYLOPUS LEANUS, *Sulliv. Mosses U. States*, p. 19; *Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc.* (ed. 1), No. 74.

SYRRHOPODON LEANUS, *Sulliv. Musc. Alleghan.* No. 172.

HAB. On much decayed logs and stumps in woods, Middle States and westward; not uncommon. Resembles the young growth of *Dicranum flagellare*.

TAB. 18, A.—CAMPYLOPUS LEANUS.

1. Plantæ naturali magnitudine.
- 2, 3. Partes plantarum.
- 4, 5, 6. Folia caulina.
7. Areolatio apicalis folii.
8. Eadem basilaris folii.
9. Sectiones foliorum transversales.
10. Apex caulis cum folio comali pluries divisus, foliorum situm abortivorum monstrans.
11. Apex caulis, duo folia abortiva aliorumque cicatrices exhibens.
12. Folia abortiva.

CAMPYLOPUS VIRIDIS, *Sulliv. & Lesqx.*

Tab. 18.

PLANTÆ subbunciales, robustiusculæ, densius cæspitosæ, saturate virides, basi radiculosæ.

CAULIS ascendenti-erectus, dichotomus, dense foliosus.

FOLIA fragillissima, itaque sæpius diffracta, erecto-aperta, lanceolato-subulata, canaliculata, carinato-costata, costa validiuscula subsemitereti ad summam apicem dentatam attingente; reti superne oblongo denso, inferne ampliore laxiore.

FLORES et fructus ignoti.

CAMPYLOPUS VIRIDIS, Sulliv. & Lesqx. *Musc. Bor.-Amer. Exsicc.* (ed. 1), No. 72; Sulliv. *Mosses U. States*, p. 19.

HAB. On the bark of prostrate dead trees, in dense woods. — Common.

TAB. 18, B. — CAMPYLOPUS VIRIDIS.

1. Plantæ *naturali magnitudine*.
2. Pars caulis cum foliis diffractis.
3. Folia.
4. Basis areolata folii.
5. Apex areolatus folii.
6. Sectiones transversales folii.
7. Pars basilaris folii.

TREMATODON LONGICOLLIS, *Michx.*

Tab. 19.

PLANTÆ brevicaules, copiose fructigeræ, in cæspitibus laxiusculis degentes, læte virides.

CAULIS 3–6-linearis, subsimplex, dense longifolius.

FOLIA patentia, flexuosa, e basi oblonga longe setacea, canaliculata, apice obtusiuscula, obscure denticulata; costa lata percurrente; areolatione inferne e cellulis oblongis pellucidis, superne minoribus opacis exstructa: perichætalia majora, erecta, lanceolata, sensim longe attenuata.

FLORES monoici: masculi in ramis plus minus brevibus basilaribus terminales; perigonalibus e basi colorata ovata setaceis; antheridiis 4–6 paraphysatis.

CAPSULA elongato-oblonga, inclinata, in collum angustum curvulum, basi latere interno abruptum, ipsa fere duplo longiorem defluens; pedicello tenui subunciali luteo; peristomii dentibus subulatis nodoso-articulatis inter articulationes pertusis striolatis, cruribus inæqualibus interdum secedentibus; annulo composito revolubili; operculo subulirostro; calyptra inflato-cuculliformi.

TREMATODON LONGICOLLIS, Michx. Fl. Bor.-Amer. 2, p. 289; Sulliv. Musc. Alleghan. No. 173; Mosses U. States, p. 20 (excl. stirp. Novanglis et Ohioensibus).

HAB. Clayey or sandy and moist soil, Southern States.

T. longicollis appears to be confined, in this country, to the more southern States, and to the sea-coast thence to New Jersey; it occurs likewise in New Zealand and Japan. The plant found in Massachusetts, Middle Pennsylvania, and Northern Ohio, and heretofore referred to this species, is *T. ambiguus*,—a native also of Europe,—which, though very closely resembling *T. longi-*

collis, is thus distinguished : — its oval capsule has a much shorter collum ; the teeth of the peristome are broader, shorter, more granulose, not nodose-articulate, their crura more inclined to separate ; the perichæatial leaves are firmer, more oblong, and more suddenly acuminate.

TAB. 19. — TREMATODON LONGICOLLIS.

1. Plantæ *naturali magnitudine*.
2. Pars plantæ.
- 3, 4. Folia caulina.
5. Apices foliorum rete exhibentes.
6. Rete folii baseos.
7. Sectiones transversales folii.
8. Folia perichæatialia, vaginula, et pedicellus.
9. Capsulæ.
10. Capsula exsiccata.
11. Capsulæ pars, peristomium et columellam monstrans.
12. Calyptra.
13. Operculum.
14. Peristomii sectio verticalis.
15. Peristomii duo dentes, sporæ, et annuli pars.
16. Annulus.
17. Antheridia, fol. perigoniale, et paraphysis.

DICRANUM DEBILE, *Hook. et Wils.*

Tab. 20.

PLANTÆ humiles, graciliores, gregariæ vel cæspitulosæ, flavescenti-virides.

CAULIS subsemiuncialis, simplex vel sæpius e basi pluries divisus, erectus vel ascendenti-erectus.

FOLIA minima, dissita, lineari-oblonga, ascendendo majora longiora confertiora, suprema longissima, subsecunda, carinato-concava, marginibus recurvis subundulatis; reti laxiore oblongo; costa valida semitereti cum vel sub apice obtusiuscula desinente.

FLORES dioici: masculi subcapituliformes, in plantis femineis minoribus terminales.

CAPSULA ovalis, erecta, operculo subulirostro ipsam æquante instructa, annulata; pedicello mediocri; peristomii dentibus inferne purpureis striolatis, in crura duo longa scabra fissis.

DICRANUM DEBILE, Hook. & Wils. in Drumm. Musc. Amer. Coll. 2, No. 51 & 52; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 46^b; Sulliv. Mosses U. States, p. 13.

TRICHOSTOMUM TENUE, Sulliv. Musc. Alleghan. No. 177.

WEISSIA EXIGUA, Schwægr. Suppl. t. 179? ex Wils. in Lond. Jour. Bot. 1844.

HAB. Banks of ditches and roadsides, Louisiana and Alabama.

TAB. 20. — DICRANUM DEBILE.

- | | |
|---|--------------------------------|
| 1. Plantæ <i>naturali magnitudine</i> . | 12, 13. Capsulæ. |
| 2. Planta fertilis. | 14. Pars peristomii. |
| 3. Planta mascula. | 15. Sectio verticalis ejusdem. |
| 4, 5, 6, 7, 8. Folia. | 16. Operculum. |
| 9. Areolatio folii baseos. | 17. Folium perigoniale. |
| 10. Eadem folii apicis. | 18. Antheridium et paraphysis. |
| 11. Sectiones trans. folii. | |

FISSIDENS HYALINUS, *Hook. et Wils.*

Tab. 21.

PLANTÆ perpusillæ, tenerrimæ, gregarie vel cæspitulse degentes, glauco-virides.

CAULIS 1–2 lineas altus, simplex, erectus vel declinatus, basi radiculis hyalinis copiose instructus.

FOLIA mollissima, explanata, 3–4-juga, inferiora minima, superiora multo majora, lanceolata, oblongo-lanceolata, interrupte anguste marginata, e cellulis amplissimis hyalinis hexagono-areolata, duplicatura ad medium producta; lamina dorsali lata ad basin evanescente; costa omnino deficiente.

FLORES dioici: feminei soli noti, terminales, diphylly.

CAPSULA oblonga, erecta, macrostoma, leptoderma, brevius pedicellata; peristomii dentibus gracilibus rubellis solidis dense articulatis; calyptra cylindraceo-conica operculi rostrum longiusculum solum tegente; sporis minimis.

FISSIDENS HYALINUS, Hook. & Wils. in Lond. Jour. Bot. 1841, p. 89, t. 2; Sulliv. Musc. Alleghan. No. 180; Mosses U. States, p. 24.

HAB. "Moist, rocky ledges, Bank Lick, on Cassidy's farm, near Cincinnati, Ohio." *T. G. Lea.*

This species, remarkable for the absence of a costa in its leaves, has been found only by the late Thomas G. Lea, who detected it in the year 1839. It has since been carefully searched for in the locality above mentioned, but without success.

TAB. 21.—FISSIDENS HYALINUS.

- | | |
|--|---------------------------------|
| 1. Plantæ naturali magnitudine. | 11. Pars peristomii cum sporis. |
| 2, 3, 4. Plantæ. | 12. Operculum et calyptra. |
| 5, 6, 7. Folia. | 13, 14. Calyptræ. |
| 8, 9. Areolatio folii. | 15. Operculum. |
| 10. Capsula operculata cum calyptra in situ. | |

FISSIDENS OBTUSIFOLIUS, *Wils.*

Tab. 22.

PLANTÆ humiles, densius gregariæ, vel cæspitulos laxiusculos efformantes, pallide virides.

CAULIS 3–6-linearis, simplex vel e basi divisus, erectus vel declinatus.

FOLIA 6–12-juga, expansa vel secunda, inferne minora obovata, superne majora oblonga, obtusa, laxiuscule pellucide areolata, cellulis angulato-rotundis; lamina apicali dimidiam vel tertiam duplicaturæ partem æquante, dorsali ad basin sensim evanida; costa sub apice desinente.

FLORES dioici terminales: masculi diphylli; antheridiis 4–6 paraphysatis; perigonalibus lamina sola apicali instructis.

CAPSULA oblongo-ovalis vel fere obovata, macrostoma, pachyderma; peristomii dentibus breviusculis basi aurantiaceis, cruribus hyalino-albidis granulosus; annulo angustissimo persistente; operculo hemisphærico apiculato; calyptra dimidiata; sporis magnis.

FISSIDENS OBTUSIFOLIUS, *Wils.* in *Lond. Jour. Bot.* 1845, p. 196, t. 9; *Sulliv. Musc. Alleghan.* No. 181; *Mosses U. States*, p. 24; *Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc.* (ed. 1), No. 78.

HAB. Ledges of wet dripping rocks, Bank Lick, near Cincinnati, *Lea.* Moist rocks, Clifton, Ohio.

Easily recognized by its obtuse leaves and short operculum.

TAB. 22. — FISSIDENS OBTUSIFOLIUS.

- | | |
|--|--------------------------------|
| 1. Plantæ <i>naturali magnitudine.</i> | 11, 12, 13. Capsulæ. |
| 2. Planta fertilis. | 14. Sectio verticalis capsulæ. |
| 3. Planta mascula. | 15. Pars peristomii. |
| 4, 5. Folia perichæt. cum archegoniis. | 16. Eadem verticaliter secta. |
| 6. Folium caulinum. | 17. Sporæ. |
| 7, 8. Areolatio ejusdem. | 18. Operculum. |
| 9. Sectiones transversales folii. | 19. Calyptra. |
| 10. Sectio trans. folii et caulis. | |

FISSIDENS EXIGUUS, *Sulliv.*

Tab. 23.

PLANTÆ perpusillæ, annuæ, laxius densiusve gregariæ, flavo-virides.

CAULIS sublinearis, erectus vel declinatus, basi sola radicans.

FOLIA 4–6-juga, in caulibus erectis explanata, in declinatis ad unum latus vergentia, oblongo-lanceolata, acuta, superiora inferioribus multo majora, immarginata, integerrima; lamina apicali duplicaturam æquante, dorsali ad basin folii evanida; costa subflexuosa fere ad apicem attingente.

FLORES dioici: masculi diphylli in plantis femineis similibus terminales; antheridiis 3–4; paraphysibus nullis.

CAPSULA terminalis, erecta, oblongo-ovalis, in pedicellum mediocrem defluens; peristomii dentibus ad medium fissis; operculo rostellato; calyptra dimidiata.

FISSIDENS EXIGUUS, Sulliv. in Mem. Amer. Acad. n. ser. 3, p. 60, t. 2; Musc. Alleghan. No. 182; Mosses U. States, p. 24.

HAB. Stones in moist and shaded ravines, dry channels of woodland brooks, &c. — Common.

Resembles the European *F. exilis*, but that has subserrulate leaves and a monoicous inflorescence.

TAB. 23. — FISSIDENS EXIGUUS.

1. Plantæ naturali magnitudine.
- 2, 3. Plantæ fertiles.
4. Planta mascula.
5. Frons infertilis.
- 6, 7, 8. Folia caulina.
9. Apex folii areolationem exhibens.
- 10, 11. Capsulæ.
12. Pars peristomii.
13. Sectio verticalis ejusdem.
14. Calyptra.
15. Antheridium et folium perigoniale.

FISSIDENS MINUTULUS, *Sulliv.*

Tab. 24.

PLANTÆ pusillæ, gregariæ, annuæ vel perennes, e luteo virides.

CAULIS 2-3 lineas vel ultra altus, simplex, raro innovationibus ramosus, erectus vel subprocumbens, basi sola radiculis copiose instructus.

FOLIA 4-10-juga, expansa vel subsecunda, inferiore minima, ascendendo multo majora, lineari-oblonga vel oblique oblongo-lanceolata, acuta, toto ambitu (apice summo subserrulato excepto) anguste marginata; lamina apicali duplicaturam latius marginatam æquante, dorsali supra basin evanescente; reti densiore; costa percurrente.

FLORES dioici: masculi di-triphylli in plantis femineis similibus terminales; antheridiis 3-9; paraphysibus nullis vel rudimentariis.

CAPSULA terminalis, ovali-oblonga, erecta, raro inclinata; peristomii dentibus atropurpureis, infra medium in crura longissima granulosa divisus; calyptra cuculliformi vix ad operculi longius rostrati basin descendente.

FISSIDENS MINUTULUS, *Sulliv.* in *Mem. Amer. Acad.* n. ser. 3, p. 58, t. 2; *Musc. Alleghan.* No. 183; *Mosses U. States*, p. 24; *Sulliv. et Lesqx. Musc. Bor. Amer. Exsicc.* (ed. 1), No. 80.

FISSIDENS BRYOIDES, var. 1 & 2, *Hook. & Wils.* in *Drumm. Musc. Amer. Coll.* 2, No. 39 & 40.

HAB. Moist rocks in woods, dry channels of rivulets, &c. —
Not uncommon.

Distinguished from the preceding by its immarginate leaves, and from small forms of *F. incurvus* by its dioicous inflorescence and usually erect capsule.

The male and female plants of *F. minutulus* grow mixed in

the same patch, and, owing to the interlacing of their rootlets, often appear to be permanently connected, but a careful examination shows the contrary. The same may be said of *F. exiguus*.

TAB. 24. — *FISSIDENS MINUTULUS*.

1. *Plantæ naturali magnitudine.*
- 2, 3, 4. *Plantæ fertiles.*
- 5, 7. *Folia caulina.*
6. *Folium perichætiale.*
8. *Apex folii areolata.*
9. *Pars duplicaturæ marginis areolationem monstrans.*
- 10, 11. *Capsulæ operculatæ, quorum duæ calyptris instructæ sunt.*
12. *Peristomii duo dentes.*
13. *Operculum et calyptra.*
14. *Calyptra.*
15. *Planta mascula.*
16. *Folia perigonia cum antheridiis.*

FISSIDENS RAVENELII, *Sulliv.*

Tab. 25.

PLANTÆ pusillæ, gregarie degentes, saturate virides, basi sola radiculosæ.

CAULIS simplex, 1–2 lineas longus, semilineam latus, erectus vel ascendens.

FOLIA 7–15-juga (in caule sterili 18–20), explanata lineari-oblonga, acuta, conferta, opaca; duplicatura ad medium producta, illa floralium limbo latissimo grossius dentato instructa; lamina apicali, ut et dorsalis, haud limbata minute denticulata; reti densissimo e cellulis minutis subrotundis chlorophyllosis prominulis extructo; costa flexuosa hyalina sub vel cum apice evanida.

FLORES dioici, terminales: plantæ masculæ minutissimæ, 4–6-phyllæ; foliis perigonialibus ventricosis margine eroso-dentatis lamina apicali (dorsali obsoleta) instructis.

CAPSULA oblonga, erecta, æqualis, leptoderma, leniter papillulosa; operculo conico longius oblique rostellato; calyptra conica uno latere fissa.

FISSIDENS RAVENELII, Sulliv. in Mem. Amer. Acad. n. ser. 4, p. 171, t. 2; Mosses U. States, p. 24; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 81.

HAB. Damp bricks and earth, Santee Canal, South Carolina, *Ravenel*. Moist ground, Society Hill, North Carolina, *Curtis*.

This species is known by its opaque and densely areolated leaves, with their laminæ minutely denticulate and immarginate, except those of the duplicature of the floral leaves, which have

a strongly dentate and broad pellucid border. The protuberant cells of the exterior wall of the dry capsule also furnish a good distinctive character.

TAB. 25. — *FISSIDENS RAVENELII*.

1. *Plantæ naturali magnitudine.*
- 2, 3. *Plantæ femineæ.*
4. *Plantæ masculæ.*
5. *Planta sterilis.*
6. *Folia caulina et perichætialia.*
7. *Folium caulis infimum.*
8. (False 10 insculp.) *sectio transversalis folii.*
9. *Particula folii floralis duplicaturæ marginem ostendens.*
10. *Areolatio folii apicis.*
- 11, 12. *Capsulæ operculatæ.*
13. *Capsula deoperculata.*
14. *Pars peristomii.*
15. *Eadem verticaliter secta.*
- 16, 17. *Opercula.*
18. *Calyptra.*
19. *Antheridia.*
- 20, 21. *Folia perigonia.*
22. *Folium perichætiale.*

FISSIDENS SUBBASILARIS, *Hedw.*

Tab. 26.

PLANTÆ humiles, in densis latis cæspitibus superne saturate viridibus degentes.

CAULIS 6–10 lineas altus, simplex vel divisus, erectus, tomento rufo obrutus, conferte foliosus.

FOLIA 12–15-juga, explanata, oblonga, breviter acuta, immarginata, tenuissime serrulata, ad $\frac{2}{3}$ duplicata; lamina dorsali lata ad basin citius evanida; costa fere ad apicem grossius erodentatam perdurante; reti denso pellucido.

FLORES feminei soli noti, prope caulis basin orti, 5–6-phylli.

CAPSULA lateralis, oblongo-ovalis vel cylindracea, erecta, curvula, in pedicello mediocri caulem paulisper superante elata; peristomii dentibus breviusculis infra medium divisis; operculo longius rostrato; calyptra cuculliformi gracili.

FISSIDENS SUBBASILARIS, Hedw. Sp. Musc. p. 155, t. 39; Sulliv. Musc. Alleghan. No. 184; Mosses U. States, p. 25.

HAB. Roots and trunks of trees, forming large and dense mats, Northern and Middle States.

TAB. 26. — FISSIDENS SUBBASILARIS.

1. Plantæ *naturali magnitudine.*
2. Planta fertilis.
3. Folium caulis.
4. Folium superius perichætii.
5. Sectio transversalis folii.
6. Areolatio folii apicis.
7. Perichætium.
8. Folium infimum ejusdem.
- 9, 10. Capsulæ.
11. Peristomii pars.
12. Eadem verticaliter secta.
13. Calyptra.

FISSIDENS POLYPODIODES, *Hedw.*

Tab. 27.

PLANTÆ proceræ, gregariæ, sola basi radiculis instructæ, lurido-virides.

CAULIS sesqui – biuncialis, simplex, rarissime ramosus, rigidus, flexuoso-erectus.

FOLIA multijuga, laxius incumbentia, lineari-oblonga, obtusiuseula; duplicatura ad medium vel ultra producta; lamina dorsali ad basin porrecta ibidemque rotundata; costa valida fere ad apicem extensa; reti firmissculo pellucido e cellulis subrotundis: perichætialia minora, inferiora ovata lamina apicali et dorsali deficientibus, superiora graciliora lamina apicali tantum instructa.

FLORES dioici, laterales: feminei versus caulis apicem 3–4 aggregati; masculi gemmiformes in axillis foliorum nidulantes.

CAPSULA in pedicello breviusculo flexuoso adscendente, elongate subpyriformi-obovata, valde macrostoma; annulo revolubili; operculo e basi hemisphærico longius rostrato.

FISSIDENS POLYPODIODES, Hedw. Musc. Frond. 3, p. 63, t. 27; Sulliv. et Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 87.

HAB. Louisiana, *Drummond.* Florida, *Chapman.* Moist rocks, Northern Georgia, *Lesquereux.*

TAB. 27. — FISSIDENS POLYPODIODES.

1. Plantæ masculæ et femineæ *naturali magnitudine.*
2. Planta fertilis.
- 3, 4. Folia caulina.
5. Basis folii.
6. Folium inferius perichæti.
7. Areolatio folii apicis.
- 8, 9, 10. Capsulæ.
11. Peristomii duo dentes cum annuli particula.
12. Sectio verticalis peristomii.
13. 14. Gemmæ masculæ.

TRICHOSTOMUM VAGINANS, *Sulliv.*

Tab. 28.

PLANTÆ elatiusculæ, gracillimæ, in cæspites superne flavo-virides confertæ.

CAULIS subuncialis, innovationibus longis erectis tenuibus ramosus.

FOLIA caulina ramulinaque minuta, erecto-appressa, anguste oblongo-lanceolata, comalia majora longius acuminata; perichaetialia longe vaginantia, subito breviter acuminata; omnia costa latissima cum apice obtusiuscula desinente, marginibus planis integerrimis, retique e cellulis inferne oblongis superne subquadratis conflato prædita.

FLORES dioici: plantæ masculæ femineis similes; floribus terminalibus subcapituliformibus; antheridiis elongatis paraphysatis.

CAPSULA cylindraceo-oblonga, regularis, pedicello longissimo pertenui elata; peristomii dentibus sedecem dilute flavescensibus lævibus (nec granulatis) 8–10-nodoso-articulatis integris subfissis vel vario modo pertusis, membrana basilari omnino nulla; annulo latissimo composito; operculo conico breviter obtuse rostrato.

TRICHOSTOMUM VAGINANS, *Sulliv. Musc. Alleghan. No. 176; Mosses U.*

States, p. 26; Sulliv. et Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 104.

TRICHOSTOMUM PUSILLUM, var., *Hook. et Wils. in Drumm. Musc. Amer. Coll. 2, No. 60 & 61.*

TRICHOSTOMUM TORTILE, var. PUSILLUM, *Müll. Synop. Musc. 1, p. 455.*

HAB. Clayey and sandy soil, from New Jersey to Missouri.

This species resembles both *T. tortile* and *T. tenue*; but these have a much narrower annulus (simple in *T. tortile*), and the teeth of their peristome are strongly papillose or granular on

the surface. The sheathing perichæatial leaves of *T. vaginans* furnish a marked distinctive character.

TAB. 28. — TRICHOSTOMUM VAGINANS.

- 1, 2. Plantæ femineæ et masculæ *naturali magnitudine*.
3. Planta fertilis.
4. Pars innovationis.
- 5, 6. Folia comalia.
7. Folium innovationis.
8. Folium caulinum.
- 9, 10. Areolatio folii.
11. Sectiones transversales folii.
12. Folia comalia et perichætialia in situ, cum pedicelli parte.
13. Folium perichætiale.
14. Capsulæ operculatæ.
15. Peristomii dentes cum annuli particula.
16. Flos masculus, folium perigoniale, antheridium cum paraphysi.

DESMATODON ARENACEUS, *Sulliv. & Lesqx.*

Tab. 29.

PLANTÆ humiles, gregariæ vel in cæspites extensos densos congestæ, quam maxime fructiferæ.

CAULIS 4–10-linearis, simplex vel innovando-ramosus, densius foliosus, basi radiculis longis copiose instructus.

FOLIA inferiora incumbentia, ovato-oblonga; comalia multo majora, e medio patula, ligulato-oblonga, obtusa, breviter apiculata, canaliculata, margine superiore papilloso-crenulato revoluta; cellulis inferioribus oblongis laxis hyalinis, superioribus minutis subquadratis valde chlorophyllosis, utraque pagina versus apicem papillosis; costa valida tereti cum vel sub apice desinente.

FLORES monoici: masculi in ramis (interdum delapsis plantas proprias sistentibus) terminales.

CAPSULA elongato-cylindracea, erecta, recta vel curvula, late annulata; peristomii dentibus sedecem e membrana lata ortis albidis punctulatis remote articulatis discretis vel e basi fere ad medium cohærentibus, dehinc liberis, inæqualiter bicuribus; operculo brevi elongato-conico obtuso; calyptra dimidiata longirostra.

DESMATODON ARENACEUS, Sulliv. et Lesqx. *Musc. Bor.-Amer. Exsicc.* (ed. 1), No. 93; Sulliv. *Mosses U. States*, p. 28.

DESMATODON OHIOENSIS, Schimp. *Synop. Musc. Europ. in adnot.* p. 159.

HAB. Sandstone rocks, Central Ohio.

This species resembles very closely *D. flavicans*, *Bryol. Europ.*, except in its peristome, which is quite short and fragile, consisting of sixteen straight white granular teeth, cohering from their

base nearly half-way up, and more or less irregularly bifid above. The peristome of *D. flavicans* is of a deep yellow color, slightly twisted; its teeth cloven to the base; the segments long, slender, and uniform.

TAB. 29. — DESMATODON ARENACEUS.

1. Plantæ naturali magnitudine.
2. Planta fertilis.
3. Ramus antheridiophorus avulsus suoque marte degens.
4. Folium comale.
5. Folium inferior caulis.
- 6, 7. Areolatio folii apicis.
8. Eadem basilaris.
9. Sectiones transversales folii.
10. Folia perichætialia, vaginula, archegonium et paraphysis.
11. Capsula operculata et calyptrata.
12. Eadem operculata.
13. Eadem deoperculata.
14. Peristomii dentes quatuor cum annuli particula.
15. Peristomium verticaliter sectum.
16. Sectio transversalis dentis peristomialis.
17. Operculum cum columellæ apice adherente.
18. Folium perigoniale.

DESMATODON PLINTHOBIUS, *Sulliv. & Lesqx.*

Tab. 30.

PLANTÆ humiles, in cæspitibus pulvinatis e glauco-viridi canescentibus confertæ.

CAULIS simplex vel innovatione divisus, subsemiuncialis, radiculis usque ad apicem instructus.

FOLIA sicca tortilia, humida erecto-patentia; inferiora ovato-oblonga, brevipila; terminalia ligulato-oblonga, obtusa, carinato-concava, toto ambitu anguste arcte revoluta ut marginata videantur, inferne laxius pellucide oblongo- superne minute quadrato-areolata, valde chlorophyllosa, papillosa; costa valida lutescente in pilum (folii fere longitudine) incanum læve flexuosum producta.

FLORES dioici: masculi gemmacei, terminales; antheridiis 8-10 copiose paraphysatis.

CAPSULA cylindraceo-oblonga, erecta, recta vel curvula, cuculato-calyptrata, in pedicello 5-10-lineari elata, speciose annulata; operculo e basi conica crasse obtuse rostrato; peristomio brevi, dentibus sedecem fragilibus haud tortis albidis granulos remote articulatis ad medium fissis.

DESMATODON PLINTHOBIUS, Sulliv. et Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 94; Sulliv. Mosses U. States, p. 28, t. 2.

HAB. Brick pavements, Charleston, South Carolina, *Ravenel*. Nashville, Tennessee, *Lesquereux*. Limestone Rocks, Pennsylvania, *Porter*. Texas, *Lindheimer*.

Very like *Desmatodon latifolius*, *Bryol. Europ.*; but that species has a leaf with a shorter hair-point, a shorter and wider capsule, an operculum with a short and obtuse rostrum, a longer calyptra descending to the base of the capsule, a simple nar-

rower and persistent annulus, a monoicous inflorescence, and a reddish peristome, the teeth of which are divided to the base, their divisions long and subulate.

TAB. 30. — DESMATODON PLINTHOBIOUS.

1. Plantæ *naturali magnitudine*.
2. Planta fertilis.
3. Planta mascula.
- 4, 5, 6, 7. Folia.
8. Areolatio folii partis superioris.
9. Eadem partis inferioris.
- 10, 11. Sectiones transversales folii.
12. Capsulæ.
13. Pars peristomii.
14. Eadem verticaliter secta.
15. Operculum.
16. Antheridia, paraphyses, et folium perigoniale.

SYRRHOPODON FLORIDANUS, *Sulliv.*

Tab. 31.

PLANTÆ robustiusculæ, laxius cæspitantes; cæspitibus superne glauco-viridibus inferne sordide flavescentibus vel brunnescentibus.

CAULIS uncialis et ultra, simplex vel fastigiato-ramosus, alte parciusque radiculari-tomentosus.

FOLIA conferta, e basi lanceolata hyalino-oblongo-areolata amplexante lineari-oblonga, acutata, canaliculato-concava, minutissime prominule guttulato-areolata, opaca; margine baseos superioris obtuse serrulato dehinc fere ad apicem bilamellato, lamellis angustis grossius repando-serratis; costa valida tereti papillosa cum vel sub apice dissoluta.

FLORES dioici: masculi gemmacei terminales, dein innovatione laterales; antheridiis numerosis paraphysibus longioribus tenuissimis.

CAPSULA elliptico-cylindræa, erecta, brevius pedicellata, pachyderma; peristomii dentibus sedecies brevibus profunde infra capsulæ orificium insertis conniventibus teneris pallide luteolis remotius articulatis, absque linea divisurali; operculo longissime aciculari-rostrato; calyptra cuculliformi ad capsulæ basin porrecta.

SYRRHOPODON FLORIDANUS, Sulliv. Mosses U. States, p. 31, t. 2; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 113.

SYRRHOPODON ALBOVAGINATUS, Schwægr. ex Hook. & Wils. in Drumm. Musc. Amer. Coll. 2, No. 37; Sulliv. Musc. Alleghan. No. 171.

HAB. On much decayed logs and stumps, Louisiana, *Drummond*. Florida, *Chapman*.

We have seen no authentic specimens of Schwægrichen's *Syrrhopodon albovaginatus* from the East Indies; but his description and figure of it (*Suppl.* t. 113) are quite inapplicable to

the moss under notice, which, in the peculiar structure of the margin of its leaf, differs from any of its congeners examined by us.

TAB. 31. — SYRRHOPODON FLORIDANUS.

1. Plantæ femineæ et masculæ *naturali magnitudine*.
2. Planta fertilis.
3. Folia caulina.
4. Folia pars superior, areolationem et margines bilamellatos exhibens.
5. Areolatio folii baseos.
6. Margo ejusdem.
7. Sectiones transversales folii.
8. Capsula calyptrata.
9. Capsula cum operculo, eadem deoperculata.
10. Orificium capsulæ cum peristomio.
11. Particula peristomii.
12. Sectio verticalis ejusdem.
13. Folium perigoniale, antheridium, et paraphyses.

ZYGODON SULLIVANTII, *C. Müll.*

Tab. 32.

PLANTÆ 1–3-unciales, gracillimæ, flexiles, ramosissimæ, in cæspitibus laxis intricato-depressis rufo-lutescentibus degentes, hic illic fascieulatim radiculosæ.

CAULIS rigidiusculus, simplex, erectus, dein decumbens iterum iterumque innovando-ramosus; innovationibus numerosis longis filiformibus flexuosis.

FOLIA haud conferta, lineali-lanceolata, acuta, arcuato-patentissima, e basi ad medium concava, margineque integerrimo reflexa, dehinc complicata, grossius serrata; reti firmiusculo inferne e cellulis elongatis superne minoribus subquadratis papillulosis valde pachydermis exstructo; costa ad apicem quandoque radicularum fasciculos exserentem perdurante.

FLORES et fructus ignoti.

ZYGODON SULLIVANTII, *C. Müll.* Synop. Musc. Frond. 1, p. 679; *Sulliv. Mosses U. States*, p. 32; *Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc.* (ed. 1), No. 114.

SYRRHOPODON EXCELSUS, *Sulliv. Musc. Alleghan.* No. 170.

HAB. Rocks, on the top of Grandfather Mountain, North Carolina, *Gray* and *Sullivant*. Summit of Black Mountain, North Carolina, *Lesquereux*.

TAB. 32. — ZYGODON SULLIVANTII.

1. Plantæ naturali magnitudine.
2. Pars plantæ.
- 3, 4, 5, 6. Folia.
- 7, 8, 9, 10, 11. Sectiones transversales foliorum.
12. Areolatio folii baseos.
13. Eadem folii apicis.

DRUMMONDIA CLAVELLATA, *Hook.*

Tab. 33.

PLANTÆ in cæspites densos latos valde depressos congestæ, saturate virides, inferne nigrescentes.

CAULIS parce divisus, 1–6-uncialis et ultra, prostratus, aphyllus, tota longitudine subtus densissime radiculosus, ramos erectos breves copiosissime exserens, sæpeque ultra cæspitis ambitum hic illic longe prorepens.

FOLIA conferta, ovato-lanceolata, patentia, concava, firmula, fere ad apicem sulcato-costata; reti denso punctiformi: perichætalia oblongiora.

FLORES dioici, terminales et innovatione laterales.

CAPSULA in ramis terminalis, ovato-globosa, microstoma, leptoderma, brevi-pedicellata; dentibus peristomialibus sedecem brevissimis truncatis; operculo e basi hemisphærico-conica oblique aciculari-rostrato; calyptra inflato-cuculliformi basi bis terve leniter plicata ad capsulæ basin producta; sporis majusculis.

DRUMMONDIA CLAVELLATA, Hook. in Drumm. Musc. Amer. No. 62; Müll.

Synop. Musc. 1, p. 687; Sulliv. Mosses U. States, p. 32, t. 2.

GYMNOSTOMUM PROREPENS, Hedw. Sp. Musc. p. 35, t. 3.

HAB. Trees, Northern and Middle States: common.

TAB. 33. — DRUMMONDIA CLAVELLATA.

- | | |
|-----------------------------------|--------------------------------------|
| 1. Plantæ naturali magnitudine. | 11. Operculum cum columellæ apice. |
| 2. Ramus fructifer. | 12, 13. Opercula et calyptra. |
| 3. Folia ramea. | 14. Particula peristomii cum sporis. |
| 4, 5. Folia perichætalia. | 15. Eadem verticaliter secta. |
| 6, 7, 8. Areolatio folii. | 16. Vaginula cum folio perichætiali. |
| 9. Sectiones transversales folii. | 17, 18. Flos masc. et perigoniale. |
| 10 Capsula operculata. | 19. Antheridium cum paraphysi. |

ORTHOTRICHUM TEXANUM, *Sulliv.*

Tab. 34.

PLANTÆ elatiusculæ, cæspitulosæ vel pulvinulatæ, fusco-vel atro-virides, inferne radiculosæ.

CAULIS subuncialis, robustiusculus, innovando-ramosus, laxius foliosus.

FOLIA lineari-lanceolata, sicca erecto-patentia, madida recurvo-patula, e medio ad apicem subcomplicata, plus minus plicato-implana, margine toto reflexa, carinato-costata, superne opaca punctiformi-areolata papillulosa; cellulis basilaribus oblongioribus pellucidis: perichætialia longiora erectiuscula, basi tenuireticulata.

FLORES monoici: masculi gemmacei, axillares; antheridiis longe pedicellatis paraphysatis.

CAPSULA immersa, oblongo-obovata, brevicolla, exsiccatione per totam longitudinem prominenter 8-costata; operculo brevius recti-rostrato; calyptra fere totam capsulam tegente valde pilosa; peristomii dentibus 8 bigeminatis vel 16 geminatis per paria approximatis pallide luteolis, ciliis sedecem rudimentariis haud raro interpositis.

ORTHOTRICHUM TEXANUM, *Sulliv.* Mosses U. States, p. 33; *Sulliv. & Lesqx.* Musc. Bor.-Amer. Exsicc. (ed. 1), No. 122 (diagnosis falsa); *Lesqx.* Musc. Calif. in Trans. Amer. Phil. Soc. Philad. (1863), p. 6.

HAB. Texas, *Wright*. Santa Fe, New Mexico, *Fendler*. Near San Francisco, California, *Bolander*.

Near *O. Sturmii*, *H. & H.*, but a larger moss, with longer, narrower, and more recurved-spreading leaves, a more hairy calyptra, and a longer capsule prominently 8-ribbed throughout

when dry. *O. Texanum* has also a double peristome, the inner one consisting of sixteen cilia, more or less rudimentary : in *O. Sturmii* the peristome is single.

TAB. 34. ORTHOTRICHUM TEXANUM.

1. Plantæ *naturali magnitudine*.
2. Planta fructigera.
3. Folium caulinum cum cellulis apicalibus et basilaribus.
4. Folii apex areolata.
- 5, 6. Sectiones transversales folii.
7. Capsulæ operculatæ.
8. Capsula deoperculata exsiccata.
9. Apex caulis fertilis (foliis exsectis), flos masculus, vaginula paraphysis et archegonio stipata, pedicellus, et calyptra pilosa capsulam obtegens.
10. Calyptra pilis adspersa.
11. Pilum superne nodoso-serratum.
12. Peristomii pars.
13. Gemma mascula.
14. Antheridium et paraphysis.

ORTHOTRICHUM EXIGUUM, *Sulliv.*

Tab. 35.

PLANTÆ perpusillæ, pulvinulos laxos saturate virides efformantes.

CAULIS 2–3 lineas altus, simplex vel fastigiato-ramosus, laxius foliosus.

FOLIA elongato-oblonga, obtuse acuminata, erecto-patentia, margine leniter recurva, ad apicem fere carinato-costata, superne punctiformi-areolata, minutissime papillosa, basi e cellulis oblongis laxius texta.

FLORES dioici: masculi gemmiformes, in plantis femineis minoribus terminales; perigonialibus orbiculari-ovatis; paraphysibus subnullis.

CAPSULA subimmersa, oblongo-ovalis, brevicolla, macrostoma, sicca lenissime lato-costata; tubo vaginali conspicuo; peristomio duplici, dentibus 16 geminatis, ciliis 8 lanceolatis dentes latitudine superantibus obtusis albidis punctulatis e cellularum duplici serie exstructis; operculo hemisphærico apiculato; calyptra nuda vel pilis rarissimis adpersa.

ORTHOTRICHUM EXIGUUM, *Sulliv.* Mosses U. States, p. 33.

HAB. On the base of trees, near the Santee Canal, South Carolina, *Ravenel*.

One of the smallest of the genus, approaching closely in many of its characters *O. obtusifolium*, *Schrad.*; which, however, is a much larger species, with a longer-necked capsule, strongly ribbed when dry; the leaves subelliptical, more obtuse, plane on their margins; the teeth of the peristome 8 bigeminate; and the cilia much narrower and yellowish.

O. exiguum is remarkable for the very broad cilia of its peristome, their breadth exceeding that of the teeth.

On the leaves of both species, excrescences like those on the leaves of *O. Lyellii* are occasionally present.

TAB. 35. — ORTHOTRICHUM EXIGUUM.

1. Plantæ femineæ et mascule *naturali magnitudine*.
2. Planta capsulifera.
3. Planta mascula.
- 4, 5, 6, 7. Folia.
8. Apex folii areolata.
9. Areolatio folii baseos.
10. Sectiones transversales folii.
11. Capsula cum foliis perichætalibus.
12. Capsula deoperculata, exsiccata.
13. Calyptra.
14. Operculum.
15. Pars peristomii.
16. Vaginula.
17. Gemma mascula cum antheridio.
18. Folium perigoniale cum antheridiis.

ORTHOTRICHUM STRANGULATUM, *Beauv.*

Tab. 36.

PLANTÆ pusillæ, fastigiato-ramosæ, in pulvinulis laxiusculis luteo-viridibus inferne fuscis degentes.

CAULIS 4–7 lineas altus, crassus, dense foliosus.

FOLIA patula, lineali-lanceolata, obtusiuscula, carinato-costata, tota longitudine margine revoluta, superne e cellulis papillulosis rotundis densius areolata, inferne laxius texta; perichætialia longiora, erecta, subvaginantia.

FLORES monoici: masculi axillares; antheridiis longe pedicellatis paraphysatis.

CAPSULA emergens, oblongo-obovata vel subelliptica, sicca et vacua prominenter 8-costata, angustissima, sub ore coarctata, vetusta sordide rubescens; pedicello capsula quintuplo brevior; vaginulæ pilosæ tubo adauctrice amplo pedicellum totum capsulæque basin investiente; calyptra glabra vel raripila fusca; operculo conico-apiculato; peristomii dentibus 8 bigeminatis pallide rufescentibus granulatis, siccis reflexis; ciliis 8 filiformibus e duplici (nec simplici ut in icone) serie cellularum exstructis.

ORTHOTRICHUM STRANGULATUM, Beauv. Prodr. p. 81; Schwagr. Suppl. t. 34; Sulliv. Musc. Alleghan. No. 128; Mosses U. States, p. 33; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 120.

HAB. Trees, rarely on rocks: common.

A small species, with short and thick stems, and densely crowded greenish-yellow foliage; the empty capsule when dry very narrow, the dark-red costæ being in contact throughout its entire length. It is often confounded with another closely related and common species, probably *O. Canadense*, Br. & Sch. (London Jour. Bot. 1843, p. 667), not of *Müller*; which is dis-

tinguished chiefly by its capsule, when deoperculate and empty, being elongate-campanulate, narrowly ribbed, and of a pale straw color, by its whitish calyptra, and the pale rusty-reddish teeth of its peristome.

Another species, yet unpublished, closely resembling the smaller forms of *O. Canadense*, has been found in Pennsylvania by Mr. T. P. James, and named by him *O. psilocarpum*: it is remarkable for its capsule-wall, when dry and empty, being ecostate, and for the erect pale greenish-yellow teeth and long irregular granular cilia of its peristome.

TAB. 36. — ORTHOTRICHUM STRANGULATUM.

1. Plantæ naturali magnitudine.
2. Planta fertilis.
3. Caulis defoliata inflorescentiam monstrans.
4. Folia.
5. Areolatio folii bascos.
6. Eadem folii apicis.
7. Sectiones transversales folii.
8. Capsula calyptrata.
9. Eadem madifacta.
10. Eadem sicca sed haud vacua.
- 11, 12. Particulæ peristomii, cillis false depictis.
13. Operculum.
14. Gemma mascula.
15. Folii perigoniale, antheridia, et paraphysis.

MACROMITRIUM DREGEI, *Hornsch.*

Tab. 37.

PLANTÆ acrocarpicæ vel innovatione pleurocarpicæ, intricato-cæspitosæ ; cæspitibus extensis laxis rigidulis rufo-fuscis.

CAULIS 2–3 uncias longus, procumbens ; ramis ascendentibus innovando-ramulosis subjulaceis gracilibus.

FOLIA conferta, erecto-patentia, sicca arcte imbricata, ovato-lanceolata, sensim acuminata, papillulosa, media basi profunde excavata, e cellulis subrotundis densius areolata, fere ad apicem usque carinato-costata, alis leniter recurvis.

FLORES monoici : masculi terminales vel axillares, gemmaceæ ; perigonalibus externis ovatis, internis obovatis apiculatis hyalinis rufis superne eroso-dentatis ; antheridiis et paraphysibus numerosis.

CAPSULA elliptico-cylindræa, in pedicello 3–4-lineari erecta, sicca basi oreque plicata ; peristomio simplici (externo deficiente) e membrana truncata breviter emergente exstructo ; operculo erecto conico-subulato ; calyptra pilosa capsulam totam tegente.

MACROMITRIUM DREGEI, Hornsch. in Linnæa 1841, p. 131 ; Sulliv. Mosses U. States, p. 31 ; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 128.

HAB. On the bark of old pine trees, top of Yonah or Bear Mountain, Georgia, *Lesquereux*.

We have not seen authenticated specimens of Hornschuch's *M. Dregei* from the Cape of Good Hope, and in thus referring our species we rely solely on his description, and on the noteworthy fact that it (as well as two other species from the Southern United States, viz. *Anomodon Toccoæ* and *Bruchia brevipes*) occurs also at the Cape (fide Herb. Taylor).

Our plant is the only representative at present known, within our limits, of *Macromitrium*, mostly a tropical and subtropical genus, abounding in species.

Since the engraving of Plate 37, we find that *C. Müller* (Bot. Zeit. 1862, p. 361) considers the Georgian Moss to be different from *M. Dregei*, *Hornsch.*, and proposes for it the name of *M. Sullivantii*.

TAB. 37. — MACROMITRIUM DREGEI.

1. Plantæ naturali magnitudine.
2. Ramus fructifer.
- 3, 4. Folia.
- 5, 6. Areolatio folii.
7. Sectiones transversales ejusdem.
8. Capsula deoperculata.
9. Operculum.
10. Segmentum capsulæ peristomium annulare exhibens.
11. Perichætialia, vaginula pilosa, et pedicelli pars.
12. Flos masculus.
13. Perigoniale externum.
14. Idem internum cum antheridiis et paraphysibus.
15. Antheridium et paraphysis.
16. Pilum calyptræ.

SCHLOTHEIMIA SULLIVANTII, C. Müll.

Tab. 38.

PLANTÆ densissime cæspitosæ; cæspitibus latis depressis compactis e olivaceo-viridi rufo-fuscis.

CAULIS reptans, 1–2-uncialis, dense ramosus; ramis assurgentibus brevissimis robustis fasciculato-ramulosis tomento radiculoso inter se arcte conjunctis.

FOLIA confertissima, recurvo-patentia, lingulata, breviter mucronulata, basi subventricosa ibidemque plus minusve plicatula, dehinc sulco medio angusto longitrorsum exarata; alis supra medium undulato-corrugatis; costa apice expansa in apiculam brevissimam exeunte; cellulis minutis hexagono-rotundis pachydermis transversim seriatis, basilaribus oblongis laxioribus: perichaetia majora, lanceolato-oblonga, laxius texta.

FLORES monoici: masculi laterales, brevi-stipitati, apertogemmacei; perigonalibus ovatis acutis; antheridiis brevibus crassis brevissime pedicellatis paraphysatis.

CAPSULA in pedicello 2–3-lineari erecta, cylindraceo-oblonga, apicem versus angustata; peristomii dentibus sedecem linealibus rufis hyalino-articulatis granulatis linea divisurali lata pellucida notatis siccitate revolutis; ciliis totidem aurantiaceis punctato-striolatis, membrana basilari vix ulla; operculo e basi conica longius subulato-rostrato; vaginula oblonga basi sola archegoniis et paraphysibus stipata apice membranula tubiformi instructa; calyptra campanulata totam capsulam obtegente apice scabra basi 5–6-lobata, lobis geniculato-conniventibus.

SCHLOTHEIMIA SULLIVANTII, C. Müll. Synop. Musc. 1, p. 756; Sulliv. Mosses U. States, p. 35, t. 2; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 127.

SCHLOTHEIMIA RUGIFOLIA, Hook. & Wils. in Drumm. Musc. Amer. Coll. 2, No. 85; Sulliv. Musc. Alleghan. No. 146.

HAB. Bark of trees, Louisiana, *Drummond*. Green County, Mississippi, *Tice*. South Carolina, *Ravenel*. Mountains of Georgia, *Lesquereux*.

TAB. 38. — SCHLOTHEIMIA SULLIVANTII.

1. Plantæ *naturali magnitudine*.
2. Ramus fructifer.
- 3, 4. Folia caulina.
5. Areolatio folii apicis.
6. Eadem folii baseos.
7. Sectio transversalis folii.
8. Calyptra capsulam immaturam obvelans.
9. Capsula absque operculo.
10. Peristomium siccum.
11. Particula ejusdem madefacta.
12. Eadem verticaliter secta.
13. Operculum.
14. Basis calyptræ.
15. Vaginula archegoniis et paraphysibus circumdata.
16. Flos masculus.
17. Folium perigoniale cum antheridiis et paraphysibus.

PTYCHOMITRIUM INCURVUM, *Schwægr.*

Tab. 39.

PLANTÆ pusillæ, laxæ cæspitosæ, rigidulæ, saturate virides, ætate fusco-flavescentes.

CAULIS 2–3-linearis, simplex vel parce innovando-ramosus, conferte foliosus.

FOLIA erecta vel incurvulo-erecta, siccitate cirrhato-crispata, lineali-lanceolata, obtusa, crassiuscula, opaca, leniter canaliculata, marginibus plana; costa lata cum vel sub apice evanida; cellulis minutis densis quadratis valde chlorophyllosis, angularibus oblongis majoribus laxioribus translucidis: perichætialia comalibus similia.

FLORES monoici: masculi gemmacei, axillares vel cladogeni; paraphysisibus subnullis.

CAPSULA ovalis, erecta, brevi-pedicellata; peristomii dentibus 16 longis subulatis remote nodoso-articulatis hic illic linea divi-seriali notatis nunquam in crura solutis pallide rufo-purpureis papillois; annulo specioso; operculo conico-aciculari recto; calyptra mitræformi longirostra plicata infra capsulam mediam producta, matura profunde 8–10-laciniata.

PTYCHOMITRIUM INCURVUM, Schwægr.; Br. & Sch.; Sulliv. Mosses U. States, p. 35.

PTYCHOMITRIUM PUSILLUM, Br. et Sch. in Lond. Jour. Bot. 1843, p. 665; Sulliv. Musc. Alleghan. No. 135.

WEISIA INCURVA, Schwægr. Suppl. t. 116.

GRIMMIA MUHLENBERGII, Brid. Bryol. Univ. 1, p. 181.

GRIMMIA HOOKERI, Drumm. Musc. Amer., No. 61.

NOTARISIA VIRGINICA, Hampe in Linnæa, 11, p. 379.

BRACHYSTELEUM HAMPEANUM, C. Müll. in Linnæa, 17, p. 597.

BRACHYSTELEUM INCURVUM, C. Müll. Synop. Musc. 1, p. 770.

HAB. On exposed rocks, Eastern New York, and southward to Georgia; also Southern Ohio.

Very like the European *Ptychomitrium pusillum*; but that species has the teeth of its peristome divided, above their broad lanceolate-deltoid base, into two unequal filiform crura.

TAB. 39. — PTYCHOMITRIUM INCURVUM.

1. Plantæ naturali magnitudine.
2. Planta fertilis.
- 3, 4. Folia caulina.
- 5, 7. Areolatio folii baseos.
6. Eadem apicis.
8. Sectiones transversales folii.
9. Capsula calyptrata.
10. Capsula deoperculata.
11. Peristomii dentes quatuor.
12. Sectio verticalis peristomii.
13. Operculum.
14. Inflorescentia.
15. Folium perigoniale cum antheridiis.
16. Folium perigoniale.



PTYCHOMITRIUM DRUMMONDII, Br. & Sch.

Tab. 40.

P. incurvo simillimum; differt tamen statura paulum majore, foliis patentioribus magis acutis apice obtuse dentato-serratis, peristomii dentibus profunde infra capsulæ orificium insertis latioribus brevioribus crebrius articulatis externa facie trabeculatis apice irregulariter fissis per paria approximatis, annuli absentia, sporis majoribus, etc.

PTYCHOMITRIUM DRUMMONDII, (Hook. & Wils.,) Br. & Sch.; Sulliv. Mosses U. States, p. 36.

GRIMMIA DRUMMONDII, Hook. & Wils. in Hook. Jour. Bot. 1841, p. 90, t. 3.

BRACHYSTELEUM DRUMMONDII, C. Müll. Synop. Musc. 1, p. 770.

HAB. On trees, Southern States, near the coast. — Not uncommon.

TAB. 40. — PTYCHOMITRIUM DRUMMONDII.

1. Plantæ naturali magnitudine.
2. Planta fertilis.
- 3, 4, 5. Folia caulina.
6. Sectio transversalis folii.
7. Areolatio folii baseos.
8. Eadem folii apicis.
9. Capsula operculata.
10. Dentes peristomii.
11. Dens peristomii verticaliter sectus.
12. Apex ejusdem.
13. Calyptra.
14. Flos masculus.
15. Folium perigoniale.
16. Antheridium cum paraphysi.

GRIMMIA AMBIGUA, *Sulliv.*

Tab. 41.

G. confertæ simillima, at foliis perichætialibus majoribus in pilum longum hyalinum scabrum productis, capsula ovali-oblonga, calyptraque cuculliformi distinguitur.

SCHISTIDIUM AMBIGUUM, Sulliv. in Mem. Amer. Acad. Sci. n. ser. 4, p. 170 ;
Mosses U. States, p. 36.

HAB. Dry rocks, Santa Fe, New Mexico, *Fendler*.

TAB. 41. — GRIMMIA AMBIGUA.

1. Plantæ *naturali magnitudine*.
- 2, 3. Rami fertiles.
4. Folium comale.
5. Folium perichætiale.
6. Folium caulinum.
7. Apex folii perichætialis areolationem exhibens.
8. Areolatio folii baseos.
- 9, 10, 11, 12. Sectiones folii.
13. Capsula cum folio perichætiali.
14. Capsulæ.
15. Particula peristomii.
16. Operculum cum columella.
17. Calyptræ.
18. Flos masculus.
19. Antheridia cum folio perigoniai.

GRIMMIA OLNEYI, *Sulliv.*

Tab. 42.

A *Grimmia trichophylla* proxima distinguenda, foliis rigidioribus haud flexuosis densius areolatis margine inferiore planis, capsula sicca lævi, pedicello brevior, peristomii dentibus apice integris vel perforatis, calyptra cuculliformi basi 2-3-fissa, etc.

GRIMMIA OLNEYI, Sulliv. Mosses U. States, p. 37; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 141.

HAB. Rocks, Smithfield, Rhode Island, *Olney*. New Haven, Connecticut, *Eaton*.

TAB. 42. — GRIMMIA OLNEYI.

1. Plantæ *naturali magnitudine*.
2. Planta fertilis.
3. Folium perichætiale.
- 4, 5. Folia caulina.
6. Apex folii piliferi areolationem monstrans.
7. Areolatio folii baseos.
- 8, 9, 10. Sectiones transversales folii.
11. Capsula cum perichætialibus.
12. Capsula operculata.
13. Eadem deoperculata sicca.
14. Pars peristomii.
15. Flos masculus.
16. Folium perigoniale.
17. Antheridium.

GRIMMIA PENNSYLVANICA, *Schwægr.*

Tab. 43.

PLANTÆ robustiores, rigidulæ, pulvinatæ et vage cæspitantes; cæspitibus densis facile solubilibus atro-viridibus leviter incanis.

CAULIS uncialis et ultra, pluries innovando-ramosus.

FOLIA dense approximata; caulina patentia, elongato-lanceolata, submutica, inferne canaliculata margineque reflexa, superne subcomplicata; costa subcontinua; reti apicali minuto quadrato, basilari e cellulis amplioribus oblongis sinuosis: perichætialia majora, in pilum hyalinum brevem scabrum attenuata.

FLORES dioici: masculi terminales et demum laterales.

CAPSULA subimmersa, oblongo-ovalis, in pedicello duplo brevior erecta, annulata, sicca lævis; perist. dentibus purpureis lanceolatis acuminatis, superne fissis atque cribrosis, inferne integris crebre articulatis; operculo conico-rostrato erecto; calyptra mitræformi, basi 4-6-fissa, ad operculi basin descendente.

GRIMMIA PENNSYLVANICA, Schwægr. Suppl. t. 25; Sulliv. Mosses U. States, p. 37; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 138.

HAB. On rocks, hilly districts, New England to Georgia.

TAB. 43. — GRIMMIA PENNSYLVANICA.

1. Plantæ *naturali magnitudine*.
2. Ramus frugifer.
3. Folium caulis.
4. Folium perichætiale.
- 5, 6, 7. Sectiones transversales folii.
8. Rete folii apicis.
9. Cellulæ sinuosæ folii baseos.
10. Capsula operculata.
11. Eadem calyptrata.
12. Pars peristomii cum annuli particula.
- 13, 14. Operculum et calyptra.
15. Flores masculi.
- 16, 17. Folium perigoniale et antheridium.

GRIMMIA CALYPTRATA, *Hook.*

Tab. 44.

PLANTÆ graciliores, in pulvinulos densos e glauco-viridi incanos congestæ.

CAULIS subuncialis, e basi procumbente ascendens, pluries ramosus, ramis longiusculis fastigiatis.

FOLIA dense conferta; inferiora erecto-patentia, elongato-lanceolata, plus minus breviter pilifera; comalia et perichætalia majora capsulam parum superantia, lineali-lanceolata, pilo hyalino scabro fere laminam æquante instructa, canaliculata, marginibus erectis vel recurvulis; costa continua; reti superiore denso punctiformi, inferiore laxo oblongo.

FLORES monoici terminales; antheridiis oblongis curvulis breviter stipitatis eparaphysatis.

CAPSULA emergens, in pedicello recto longitudinem suam paululum superante erecta, oblongo-ovalis, macrostoma, exannulata, sicca lævis; peristomii dentibus lanceolatis fere ad basin usque valde cribrosis; operculo conico rostrato; calyptra (icon mala) campanulato-mitræformi irregulariter rugoso-plicata 5-6-lobata uno alterove latere profunde incisa capsulæ $\frac{2}{3}$ obtegente.

GRIMMIA CALYPTRATA, *Hook.* in *Drumm. Musc. Amer.* n. 60; *Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc.* (ed. 1), No. 139.

GÜMBELIA CALYPTRATA, *C. Müll. Synop. Musc.* 2, p. 773.

HAB. Rocky Mountains, *Drummond.* Santa Fe, New Mexico, *Fendler.*

In size and aspect this species approaches very closely *G. leucophæa*, *Grev.* Its leaves, however, are narrower, not so concave, and less spreading; the mouth of the capsule is wider, and the calyptra larger. But the absence of the annulus and

the monoicous inflorescence of *G. calyptrata* furnish the essential distinctive characters.

Grimmia longirostris, Hook. (Mus. Exot. t. 62), from the Andes of South America, appears to be another very nearly related species, differing mainly in its annulate capsule and the long rostrum of its operculum.

TAB. 44. — GRIMMIA CALYPTRATA.

1. Plantæ naturali magnitudine.
2. Ramus fructifer.
- 3, 4. Folia caulina.
5. Folia rete basilare.
6. Ejusdem rete apicale.
7. Pars pili.
- 8, 9. Sectiones transversales folii.
10. Capsula calyptrata cum folio perigoniali.
11. Capsulæ operculatæ.
12. Capsula deoperculata sicca.
13. Particula peristomii.
14. Dens peristomii a latere visus.
15. Ejusdem particula apicalis.
16. Calyptra (false depicta).
17. Vaginula membranula tubiformi adaueta.
18. Flos masculus et perigoniale antheridia inclu-

COSCINODON WRIGHTII, *Sulliv.*

Tab. 45.

PLANTÆ pusillæ, compacte pulvinulatæ, terra obrutæ, e sordide viridi incanæ.

CAULIS 3-4 lineas altus, simplex vel fastigiato-ramosus, basi sola radiculosus.

FOLIA arcte imbricantia; inferiora ovalia; superiora majora obovata, cochleariformi-concava; omnia apice eroso-dentata, costa valida in pilum incanum serratum lamina duplo longiorem exeunte instructa, basi laxè pellucide oblongo-areolata; cellulis mediis et apicalibus minoribus oblongo-ovalibus, illis valde chlorophyllosis, his hyalinis.

FLORES monoici: masculi in ramis terminales; perigonalibus ovatis vix costatis; antheridiis elongatis parce paraphysatis.

CAPSULA immersa, in pedicello brevissimo curvulo erecta, ovali-oblonga, basi truncata, tenui-membranacea, sicca lævis; annulo lato fragmentarie secedente; peristomii dentibus sedecem lanceolatis purpureis apice irregulariter 2-3-fissis, inferne cribrosis; operculo e basi depresso-conica rostellato; calyptra mitræformi multoties plicata infra capsulæ medium descendente; vaginula apice breviter fimbriata.

COSCINODON WRIGHTII, Sulliv. Mosses U. States, p. 38, t. 4; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 132.

HAB. On rocks near San Marcos, Texas, *Wright*. Santa Fe, New Mexico, *Fendler*.

The only known congener of this species is the European *C. pulvinatus*, in which the capsule is obovate and emergent, with a very large operculum and a simple and narrow annulus;

the pedicel is longer than the capsule; the leaves are long-lanceolate, the costa reaching to the summit only of their lamina. The inflorescence also is different, being dioicous.

TAB. 45. — COSCINODON WRIGHTII.

- 1, 2. Plantæ et ramus masculus avulsus, *naturali magnitudine*.
3. Planta capsulifera cum ramo masculino.
- 4, 5, 6. Folia.
7. Folium areolationem monstrans.
- 8, 9. Sectiones transversales folii.
10. Capsula calyptrata.
11. Capsula operculata.
12. Capsula absque operculo.
13. Particula peristomii annulati.
14. Calyptræ sectio transversalis.
15. Folia perigonia et antheridia cum paraphysi.
16. Antheridium et paraphysis.

ATRICHUM CRISPUM, *James*.

Tab. 46.

PLANTÆ dense gregariæ, e rhizomate subterraneo ortæ, saturate virides.

CAULIS 1 – 2 uncias altus, flexuoso-erectus, subsimplex, tenuis, rigidulus, brunneo-nitidus, sola basi radiculis copiosissimis instructus.

FOLIA ampla, erecto-patentia et patula, haud vaginantia; inferiora remota, lanceolata vel elongato-lanceolata; superiora et summa approximata, majora, ligulato-lanceolata; utraque ala undulata exsiccatione crispata, limbo angusto rufescente argute serrato circumcincta, subtus lævia; costa percurrente subtereti, parcissime anguste lamellosa; reti denso e cellulis minutis rotundato-hexagonis chlorophyllosis, basilari laxo ampliore oblongo.

FLORES dioici: masculi anthoidei; perigonalibus externis tribus magnis spathulato-lanceolatis, interioribus numerosis minimis obcordatis acuminulatis; antheridiis angustis; paraphysibus filiformibus.

CAPSULA erecta vel inclinata, recta vel curvula, obovato-cylindracea, basi in pedicellum subuncialem sensim defluens, macrostoma; peristomii dentibus 32 lineali-lingulatis hyalino-albidis, linea axili rufo-aurantiaca excepta; calyptra anguste cuculliformi sola apice spinuloso-hirta; operculo conico longirostro.

ATRICHUM CRISPUM, *James* in Jour. Acad. Nat. Sci. Philad.; Sulliv. Mosses U. States, p. 41; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 209^b.

HAB. Grassy banks of small streams, near Camden, New Jersey, *James*.

The form of the capsule, and the absence of teeth on the lower surface of the lamina of the leaf, are among the most obvious characters of this very distinct species.

TAB. 46. — ATRICHUM CRISPUM.

1. Plantæ naturali magnitudine.
2. Planta fertilis.
3. Eadem mascula.
- 4, 5. Folia caulina.
- 6, 7. Folia perigonialia.
8. Apex areolatus folii caulinis.
9. Cellulæ basilares.
- 10, 11. Sectiones transversales folii.
12. Capsula operculata et calyptrata.
13. Eadem absque calyptra.
14. Operculum.
15. Ejusdem rostri sectiones transversales.
16. Peristomium cum epiphragmite.
17. Pars peristomii.
18. Calyptra.
19. Apex ejusdem.
20. Pilum ejusdem.

POGONATUM BREVICAULE, *Brid.*

Tab. 47.

PLANTÆ humiles, laxe gregariæ, e prothallio confervoideo persistente enascentes.

CAULIS simplex, 2-3-linearis, basi radiculis copiosis instructus, densissime foliosus.

FOLIA infima minuta, appressa, late ovata vel obovata, acuminata; media majora erecto-patentia, amplexantia, lanceolato-acuminata; perichætialia maxima, e basi oblonga membranacea obsolete costata vaginante subitius producta in acumen longum erectum obtuse serratum costaque lata lamellosa fere impletum, lamellis in sectione transversali capitato-clavæformibus.

FLORES dioici: masculi nondum observati.

CAPSULA elongato-cylindracea, in pedicello subunciali erecta, papillosa, collo indistincto; peristomii dentibus 32 lingulatis ad latera hyalinis in medio rufo-aurantiis; columella 4-7-alata; operculo e basi depresso-convexa tumida curvulirostro; calyptræ indumento villosa capsulam pro parte maxima vel totam obtegente.

POGONATUM BREVICAULE, *Brid.* *Bryol. Univ.* 2, p. 114; *Sulliv. Mosses U. States*, p. 41.

POLYTRICHUM PENNSYLVANICUM, *Hedw. Sp. Musc.* p. 96, t. 21.

HAB. Moist clayey banks, Eastern States and westward.
— Common.

TAB. 47. — POGONATUM BREVICAULE.

1. Plantæ naturali magnitudine.
2. Planta fertilis.
3. Caulis foliosus cum pedicelli parte.

4. Folium perichætiale, cum ejusdem particulis areolationem exhibentibus.
- 5, 6, 7. Sectiones transversales folii costæ lamellas monstrantes.
8. Folium caulis baseos.
9. Calyptra villosa capsulam investiens.
10. Capsula operculata.
11. Sectio transversalis capsulæ monstrans, — *a*, membranam capsularem extus papillosam; *b*, filamenta externam sporangii membranam sustinentia; *c*, columellam membrana sporangii interna adherente 4 – 7-alatam; *d*, sporas.
12. Particulæ membranæ capsularis transverse sectæ.
13. Peristomium.
14. Dentes peristomii.
15. Operculum.
16. Particulæ indumenti villosi pilorum.

POGONATUM BRACHYPHYLLUM, *Michx.*

Tab. 48.

PLANTÆ humiles, rigidæ, dense gregariæ, olivaceo-virides, demum fusco-rubentes, e prothallio radiculari innovantes.

CAULIS linea brevior, e basi sola radiculos numerosissimos proferens, rosulato-foliosus.

FOLIA conferta; inferiora minuta, squamiformia, decolora; cætera multo majora duplo triplore caule longiora, media valde patentia, summa erectiuscula, e basi lata brevi membranacea laxè oblongo-reticulata amplexante oblongo-lanceolata, obtusiuscule acuta, margine integra; costa superne dilatata dense lamelligera totamque fere paginam explente; lamellis latis margine incrassatis.

FLORES dioici: masculi hucusque ignoti.

CAPSULA e collo parvulo gibboso-ovata et brevi-oblonga, cernua, pachyderma, cellulis parietis externi prominulis papillosa, luteofusca, sicca plus minus costulata atque sub ore ampliato constricta; columella 4-6-alata; pedicello 7-10-lineari firmo atropurpureo sicco dextrorsum torto; peristomii dentibus 32 ligulatis acutis rufo-aurantiis ad margines hyalino-albescentibus; membrana basilari exserta; operculo depresso convexo-conico apiculato; mitra villosa calyptræ brunneo-rufa ultra capsulæ medium producta.

POGONATUM BRACHYPHYLLUM, Michx. Fl. Bor.-Amer. 2, p. 294; Schwægr. Suppl. t. 156; Brid. Bryol. Univ. 2, p. 113; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 211.

HAB. Moist clayey banks, Texas, *Wright*. Louisiana, *Drummond*. Green County, Mississippi, *Tice*. Wilmington, North Carolina, *Curtis*.

Pogonatum brachyphyllum is a somewhat smaller species than *P. brevicaule*, and has a much shorter stem, as well as rosulate

broader and entire leaves, with a shorter vaginal base ; the lamellæ of the costa are more numerous and crowded, and less thickened on their margin ; the capsule is shorter, subgibbous, and cernuous, with a shorter operculum, and a brownish-red villous calyptra.

The two species represent, in this country, the European *P. nanum* and *P. aloides*.

TAB. 48. — *POGONATUM BRACHYPHYLLUM*.

1. Plantæ fertiles *naturali magnitudine*.
2. Planta capsulifera.
- 3, 4. Folia superiora caulis.
5. Areolatio folii bascos.
- 6, 7. Sectiones transversales folii lamellas monstrantes.
8. Portio lamellæ a latere visa.
9. Capsula operculata.
10. Eadem calyptrata.
11. Eadem sicca absque operculo et calyptra.
12. Sectio transversalis capsulæ.
13. Peristomium, orificio membrana tympaniformi obtecto.
14. Tres dentes peristomii cum sporis.
15. Frustrum transversale dentis.
16. Operculum.
17. Indumentum villosum calyptræ.
18. Ejusdem pili ramosi.

POGONATUM CAPILLARE, *Michx.*

Tab. 49.

PLANTÆ humiles, gregariæ vel in cæspitibus laxis superne glaucescenti-viridibus inferne rufescentibus degentes, sola basi radicanter.

CAULIS subuncialis, tenuis, simplex, raro sub perichætio innovans, laxè foliosus.

FOLIA inferiora minuta, dissita, subappressa, ascendendo-majora et patula; comalia majuscula, e basi membranacea breviter vaginante linealia, acuta, margine argute serrata, tota superficie superiore (illa partis vaginantis excepta) lamelligera, lamellis incrassato-marginatis.

FLORES dioici: plantæ masculæ fertilibus minores, e floribus centro prolificantes; floribus anthoideis; perigonalibus interioribus brevioribus latissime ovatis acuminatis; paraphysibus partim filiformibus partim apice expansis.

CAPSULA oblongo-cylindracea, erecta, pedicello tenui suffulta, papillulosa, leptoderma; peristomii dentibus 32 longiusculis lingulatis acutis e membrana basilari vix emersa oriundis hyalinis in axi aurantiaceis; operculo e basi depresso-hemisphærica longius flexuose erecto-rostrato; indumento villoso capsulæ $\frac{2}{3}$ tegente.

POGONATUM CAPILLARE, Michx. Fl. Bor.-Amer. 2, p. 294; Brid. Bryol. Univ. 2, p. 128; Sulliv. Musc. Alleghan. No. 115.

POGONATUM URNIGERUM, Drumm. Musc. Amer. No. 284, ex parte.

HAB. Canada, *Michaux*. White Mountains, New Hampshire, *Barratt*, *Tuckerman*, *Gray*, *Oakes*, *James*. Rocky Mountains, *Drummond*.

Resembles closely *P. urnigerum*; but that is a larger, more robust, and more rigid species; its leaves are more crowded and

above the vaginal portion are of a linear-lanceolate outline, gradually tapering to a sharp point (not ligulate or sublingulate and shortly acuminate), and have the lamellæ more densely packed; the capsule-wall is thicker and firmer; the teeth of the peristome are shorter, obtuse, and deeper colored, their basilar membrane projecting much (not merely visible) above the mouth of the capsule; and the villous covering of the calyptra envelops the whole capsule.

TAB. 49. — *POGONATUM CAPILLARE*.

1. *Plantæ naturali magnitudine.*
2. *Planta feminea.*
3. *Planta mascula.*
4. *Folium comale.*
- 5, 6. *Ejusdem sectiones transversales.*
7. *Capsula operculata.*
8. *Eadem calyptrata et mitra villosa oblecta.*
9. *Eadem deoperculata, vacua.*
10. *Sectio transversalis capsulæ.*
11. *Peristomium.*
12. *Dentes ejusdem.*
13. *Operculum.*
- 14, 15. *Pili ramosi mitræ villosæ.*
16. *Folium perigoniale.*
17. *Antheridia et paraphyses.*

BRYUM LESCURIANUM, *Sulliv.*

Tab. 50.

PLANTÆ pusillæ, gregariæ vel interrupte cæspitosæ, viridilutescentes, nullo rubore tinctæ.

CAULIS 6–10 lineas longus, simplex, declinatus, basi parce radiculosus.

FOLIA inferiora remota, parvula, anguste lanceolata; superiora majora in comam polyphyllam conferta, erecto-patentia, elongato-lanceolata; perichætialia longe linealia, acutata; omnia summo apice leviter serrata, laxius areolata, costa valida ad apicem fere attingente instructa.

FLORES dioici: plantæ masculæ minores, floribus terminalibus; perigonalibus exterioribus e basi concava erecta subulatis patentibus, interioribus multo brevioribus ovatis acutis; antheridiis numerosis paraphysatis.

CAPSULA in pedicello e basi subgeniculata flexuoso-erecto pendula, pyriformis, sicca operculo detruso valde macrostoma; annulo duplici revolubili; peristomii duplicis dentibus linealilanceolatis subulatis pallide luteis remotius articulatis, processibus in linea carinali fissis, ciliolis singulis interjectis; operculo hemisphærico-apiculato.

BRYUM LESCURIANUM, *Sulliv.* in *Mem. Amer. Acad. n. ser.* 4; *Sulliv. Mosses U. States*, p. 44.

BRYUM PULCHELLUM, *Musc. Alleghan.* No. 101, nec *Hedw.*

HAB. Clay banks, Cincinnati, Ohio, *Lea.* Lancaster, Ohio, and near the Dismal Swamp, Virginia, *Lesquereux.* Pennsylvania and New Hampshire, *James.*

Besides other marks of less importance, such as the plane margins of the leaf, and the absence of redness in any part of

the plant, the presence of an annulus at once distinguishes this species from its nearest congener, *B. pulchellum*, an alpine species which has not yet been found in this country.

Small forms of *B. carneum* very much resemble our plant; but the areolation of the leaf in that species is larger and looser; it is also, like *B. pulchellum*, destitute of an annulus.

TAB. 50. — BRYUM LESCURIANUM.

1. Plantæ *naturali magnitudine*.
2. Planta fertilis.
3. Pars plantæ masculæ.
4. Folium perichætiale.
- 5, 6. Folia caulina.
7. Basis folii areolata.
8. Apex folii areolata.
9. Sectiones transversales folii.
10. Capsula deoperculata.
11. Capsulæ siccæ.
12. Opercula.
13. Particula peristomii.
14. Flos masculus.
15. Perigoniale, antheridia, et paraphyses.

MNIUM DRUMMONDII, *Br. & Sch.*

Tab. 51.

PLANTÆ cæspitosæ, læte virides, inferne tomento rufo-ferrugineo intertextæ.

CAULIS uncialis et ultra, simplex, laxius foliosus; ramulis basilaribus erectis strictis.

FOLIA recurvo-patentia, basi decurrentia; inferiora remota, parvula, elliptico-obovata; media et comalia sensim majora, confertiora, lanceolato-obovata; perichætialia exteriora oblongo-spathulata, interiora minima lanceolata; omnia mucroniformi-apiculata, limboque angusto lutescente superne ciliolato-dentato cincta; costa crassiore subcontinua; reti e cellulis rotundato-hexagonis chlorophyllosis, basilaribus oblongis subinanibus, formato.

FLORES synoici: antheridia paraphysibus longioribus filiformibus haud numerosis.

CAPSULÆ sæpe 2-3 ex eodem perichætio, ovaes oblongo-ovalesve, subpendulæ, annulatæ; peristomii dentibus linealilanceolatis lutescentibus, ciliis aurantiaceis in carina late lacunosis, ciliolis 2-3 interpositis; operculo mamillari; calyptra angustissima fugaci.

MNIUM DRUMMONDII, *Br. & Sch.* in *Lond. Jour. Bot.* 2, p. 669; *Sulliv. Mosses U. States*, p. 47; *Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc.* (ed. 1), No. 199.

MNIUM SPINOSUM, *Drumm. Musc. Amer.* No. 257, ex parte.

HAB. Near Smoking River, British America, *Drummond*.
White Mountains, New Hampshire, *Oakes*.

The synoicous inflorescence, the erect and stiff infertile branches, the decurrent and narrowly bordered leaves, which

are simply spinulose-dentate from the middle upwards, and the rather short capsules, are the leading characters of *M. Drummondii*.

TAB. 51. — *MNIUM DRUMMONDII*.

1. Plantæ *naturali magnitudine*.
2. Planta *fertilis*.
3. Folium *perichætii externum*.
4. Folia *caulina*.
5. Apex folii *areolationem monstrans*.
6. Cellulæ *ejusdem*.
- 7, 8. Capsulæ.
9. Pars *peristomii*.
10. Operculum *cum apice columellæ adhærente*.
11. Operculum.
12. Apex *caulis*, *antheridia*, *archegonia*, *paraphyses*, *perichætiale intimum*,
vaginulæ duæ, *quarum una pedicello apice calyptrato instructa*.
13. *Archegonium*, *antheridium*, *et paraphysis*.



BARTRAMIA RADICALIS, Beauv.

Tab. 52.

PLANTÆ molles, laxiuscule pulvinantes, glauco- vel luteo-virides, inferne fuscescentes et toto fere longitudine tomento ferrugineo intertextæ.

CAULIS breviusculus, e basi decumbente ascendens, sub apice fertili verticillato-ramulosus.

FOLIA erecto-patentia et subsecunda, lineali-lanceolata, longius cuspidata, argute serrata, solum superiore pagina papillosa; costa sub vel ultra apicem producta: perichætialia late ovata, subito setacea.

FLORES monoici: masculi gemmacei, femineis approximati; perigonalibus e basi valde concava longe subulata; antheridiis elongatis; paraphysibus longioribus subelavæformibus.

CAPSULA in pedicello longo tenui flexuoso subhorizontalis, globosa; operculo minuto convexo-apiculato; peristomii dentibus lineali-lanceolatis in subulam productis rufo-auranteis, processibus luteis longitrorsum moniliformi-striolatis hic illic pertusis, ciliolis binis brevibus interjectis; sporis papillosis.

BARTRAMIA RADICALIS, Beauv. Prodr. p. 44; Schwægr. Suppl. t. 61; C. Müll. Synop. 1, p. 485; Sulliv. Mosses U. States, p. 50; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 169.

BARTRAMIA LONGISETA, Michx. Fl. Bor.-Amer. 2, p. 301.

HAB. On the ground in wet, springy places, margins of swamps, &c., Southern States. — Not uncommon.

B. radicalis is very near the European *B. rigida*, whose place in this country it seems to supply. The latter species, however, has a less linear leaf, papillose on the lower surface only and reflexed on the margins, a thicker and shorter pedicel, and an oblong-globose capsule with a thicker exterior membrane.

Small forms of *B. Marchica* (*B. Muhlenbergii*) are not easily distinguished from *B. radicalis*, except by the inflorescence, which in the former is dioicous.

TAB. 52. — *BARTRAMIA RADICALIS*.

1. Plantæ *naturali magnitudine*.
2. Planta fructifer.
3. Particula ramuli.
4. Folium ejusdem.
5. Rete folii baseos.
6. Idem apicis.
7. Sectiones transversales folii.
8. Capsula operculata.
9. Peristomium.
10. Particula ejusdem.
11. Inflorescentia.
12. Flos masculus.
13. Folium perigoniale.
14. Antheridium cum paraphysi.
15. Operculum.

FUNARIA FLAVICANS, *Michx.*

Tab. 53.

PLANTÆ annuæ, raro biennes, teneræ, in cæspitibus laxis læte viridibus degentes, basi radiculis intertextæ.

CAULIS 3–10 lineas altus, inferne subnudus, superne congesto-foliosus.

FOLIA inferiora remota minutissima; superiora in gemmam conniventia, magna, mollia, tenerrima, concava, late obovato-elliptica vel oblongo-subspathulata, in acumen longiusculum subito exeuntia; reti amplo laxissimo oblongo-hexagono; costa tenui subexcedente vel cum acumine finiente.

FLORES monoici terminales: flos masculus subdiscoideus in caule primario; femineus in innovatione propria tandem prævalente; antheridiis oblongis; paraphysibus longioribus numerosis apice valde inflatis.

CAPSULA subhorizontalis, una cum collo in pedicellum tenuem longissimum sensim attenuata, pyriformis, subincurva; peristomii dentibus rufo-aurantiaceis lanceolato-subulatis obliquatis apice appendiculatis, processibus dentibus oppositis luteis; annulo specioso revolubili; opereulo plano-convexo vix apiculato; calyptra magna vesiculoso-cucullata longissime tenui-rostrata; sporis pallide luteis lævibus.

FUNARIA FLAVICANS, Michx. Fl. Bor.-Amer. 2, p. 303; Schwægr. Suppl. t. 65; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 158; Sulliv. Mosses U. States, p. 50.

HAB. Moist, sandy, and clayey ground, Middle and Southern States.

F. flavicans compared with *F. hygrometrica*, which in size and general aspect it much resembles, is a paler-colored moss; its

leaves are suddenly produced into a long narrow point; and the mouth of its capsule is larger and less oblique; its spores are larger, being $\frac{1}{1400}$ of an inch in diameter, those of *F. hygrometrica* having a diameter of only $\frac{1}{2600}$ of an inch.

TAB. 53. — FUNARIA FLAVICANS.

1. Plantæ naturali magnitudine.
2. Planta fertilis junior.
- 3, 4, 5. Folia comalia.
6. Rete folii baseos.
7. Idem folii apicis.
8. Sectiones transversales folii.
9. Capsula calyptrata.
10. Eadem operculata.
11. Eadem sine operculo.
12. Eadem vacua sicca.
13. Peristomium.
14. Particulæ peristomii et annuli.
15. Operculum cum annulo.
16. Antheridia et paraphyses.

FUNARIA SERRATA, *Beauv.*

Tab. 54.

PLANTÆ annuæ vel biennes, gregariæ, vel cæspitulos laxos tristius virides efformantes.

CAULIS 2-4-linearis, dimidio inferiore radiculoso defoliatus, superne conferte foliosus.

FOLIA majuscula in gemmam apertam congesta; exteriora elliptico-lanceolata; comalia et perichætialia oblongo- vel ligulato-lanceolata; omnia brevius acuminata, limbo luteo superne serrato circumducta; costa sub apice desinente; reti laxo e cellulis hexagono-oblongis, basilaribus amplioribus elongatis, exstructo.

FLORES monoici, utriusque sexus terminales: flos masculus specie in ramo radicali.

CAPSULA in pedicello longo sicco tota longitudine sinistrorsum torto pyriformis, erecto-incurva, orificio obliquo; annulo nullo; sporis majusculis; operculo deplanato-convexo apiculato; calyptra generis.

FUNARIA SERRATA, Beauv. in Brid. Bryol. Univ. 2, p. 57; Hook. & Wils. in Drumm. Musc. Amer. Coll. 2, No. 76; Sulliv. Musc. Alleghan. No. 126; C. Müll. Synop. Musc. 2, p. 542; nec Bryol. Europ. t. 324.

HAB. Moist and clayey soil, in exposed situations, in the Southern States.

F. serrata, Beauv., is nearly allied to the three species here briefly characterized, viz.:—

1. *F. CONVEXA*, *Spruce*; foliis obovatis vel oblongo-obovatis in acumen tenue breviusculum subito attenuatis superne serratis; operculo depresso-convexo mutico; pedicello sicco superne sinistrorsum inferne dextrorsum torto. — *F. convexa*, Spruce, Musc. Pyren.; Schimp. Synop. Musc. Europ. p. 322. *F. serrata*, Bryol. Europ. t. 324. — Found only in Europe, and until recently confounded with *F. serrata*, Beauv., an exclusively North American species.

2. *F. HIBERNICA*, *Hook.*; foliis oblongo-lanceolatis superne grosse serratis in acumen longum flexuosum desinentibus; operculo convexo-conico; pedicello exsiccatō omnino sinistrorsum torto. — *F. Hibernica*, Bryol. Europ. t. 304; Müll. Synop.; Schimp. Synop. — Europe and California, *Bigelow*.

3. *F. CALCAREA*, *Wahl.*; foliis obovato-oblongis acumine filiformi longiusculo instructis vel obovato-spathulatis brevius tenui-acuminatis luteo-limbatis integris vel obtuse serratis; operculo convexo-conico; pedicello siccitate superne ad dextram inferne ad levam torto. — *F. calcarea*, *Wahl.* (1806), ex Schimp. Synop. Musc. Europ. p. 320, 1860. *F. Muhlenbergii*, Schwægr. Suppl. t. 66, ex Bryol. Europ., Müll. Synop. et Bryol. Brit. — Europe, Northern Africa. California, *Bigelow*, *Bolander*.

For this last species, long current under the name of *F. Muhlenbergii*, *Schwægr.*, Schimper (Synop. l. c.) adopts *F. calcarea*, *Wahl.*, as the prior name, alleging that *F. Muhlenbergii*, founded on Pennsylvania specimens sent to Hedwig, differs in many particulars (not stated) from *F. calcarea*, *Wahl.*

Of *F. Muhlenbergii*, as understood by Schimper, we have seen no specimens.

TAB. 54. — FUNARIA SERRATA.

1. Plantæ naturali magnitudine.
2. Caulis cum foliis et ramulo masculino.
- 3, 4. Folia perichætalia.
5. Rete folii apicis.
6. Idem baseos.
7. Sectiones transversales folii.
8. Capsula deoperculata.
9. Eadem cum operculo et calyptra.
10. Capsula exsiccata.
11. Particula peristomii.
- 12, 13. Opercula.
14. Calyptra.
15. Antheridium et paraphysis.
16. Pars basilaris pedicelli.

ENTOSTHODON DRUMMONDII, *Sulliv.*

Tab. 55.

PLANTÆ subannuæ, gregariæ vel cæspitulosæ, e flavescenti virides, sola basi radiculis instructæ.

CAULIS 2–4 lineas altus, inferne subnudus, superne congesto-foliosus.

FOLIA subconniventia, lanceolato-obovata vel ligulato-lanceolata, concava, margine plus minus luteis cellulis prominulis subcrenolata; costa sub vel cum apice evanida; reti laxo folii apicem versus elongato-hexagono, inferne ampliore rectangulo hyalino.

FLORES monoici: flos masculus in caule primario ramum fertilem demum superantem exserente terminalis; antheridiis breviusculis; paraphysibus apice oblongo-inflatis.

CAPSULA brevi-pyriformis, symmetrica, in pedicello siccitate omnino sinistrorsum torto flexuoso-erecto erecta, microstoma, sicca deoperculata oblonga, ore ampliato; peristomii dentibus lineali-lanceolatis rufescentibus longitudinaliter granuloso-striolatis, articulationibus remotis opacis obscuris, linea divisurali nulla vel obsoletissima; operculo depresso-convexo vix apiculato; calyptra vesiculoso-cuculliformi longe subulato-rostrato; sporis angulato-rotundis brunneo-fuscis papillulosis.

ENTOSTHODON DRUMMONDII, Sulliv. Mosses U. States, p. 51, t. 4; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 156^b.

ENTOSTHODON OBTUSIFOLIUS, Hook. & Wils. in Drumm. Musc. Amer. Coll. 2, No. 36.

HAB. Moist, clayey soil, Louisiana, *Drummond*. Near Montgomery, Alabama, *Sullivant*. — Very rare.

The short pyriform capsule and the long subulate rostrum of the calyptra, besides other marks, readily distinguish this species

from the nearly allied *E. Templetoni*, Schwagr., and *E. obtusifolius*, J. D. Hooker.

TAB. 55. — ENTOSTHODON DRUMMONDII.

1. Plantæ naturali magnitudine.
2. Planta fertilis.
- 3, 4. Folia plantarum fertilium in situ.
5. Folium perichætiali.
6. Areolatio folii apicis.
- 7, 8. Capsulæ operculatæ.
9. Capsula sicca absque operculo.
10. Peristomium.
11. Particula ejusdem (male delineata, dentibus vix linea divisurali instructis).
12. Eadem verticaliter secta.
13. Antheridia cum folio perigoniai.
14. Antheridium.
15. Calyptræ.
16. Antheridia et paraphyses.
17. Paraphysis.

PHYSCOMITRIUM IMMERSUM, *Sulliv.*

Tab. 56.

PLANTÆ humiles, annuæ, gregariæ vel cæspitulos laxos læte virides efformantes.

CAULIS 2–4 lineas altus, simplex vel innovando-ramosus, inferne radiculis copiose instructus.

FOLIA majuscula, mollia, obovato- vel lingulato-lanceolata, acuminata, e medio ad apicem serrata; costa percurrente; reti laxo amplo, cellulis superioribus oblongo-hexagonis, inferioribus majoribus oblongis, marginalibus plus minus luteolis.

FLORES monoici: flos masculus in caule juniore terminalis, tandem innovatione fertili sub eo egrediente ad latus dejectus; paraphysibus apice maxime inflatis.

CAPSULA immersa, subglobosa, operculo magno alte convexo-apiculato delapso hemisphærica, collo indistincto; pedicello brevissimo; calyptra erecta longirostra basi subquadriloba vix ad operculi medium descendente.

PHYSCOMITRIUM IMMERSUM, *Sulliv.* in *Gray*, *Man. Bot.* ed. 1, 1848; *Mosses U. States*, p. 51, t. 4; *Musc. Cubenses*, No. 7.

PHYSCOMITRIUM SPHÆRICUM VAR. ? *Sulliv.* *Musc. Alleghan.* No. 196.

HAB. River banks, Southern Ohio, *Lea*. Western Pennsylvania, *Lesquereux*. Island of Cuba, *Wright*. South Carolina, *Ravenel*.

The nearly allied *Physcomitrium sphæricum* has an exserted capsule, with a distinct collum, a larger calyptra, and a smaller operculum, as well as muticous leaves with nearly entire margins.

In size and external appearance *Physcomitrium immersum* approaches very closely the next species, *Aphanorhegma serratum*,

with which it is often found growing; but their different operculum and inflorescence at once distinguish them.

TAB. 56. — *PHYSCOMITRIUM IMMERSUM.*

1. Plantæ *naturali magnitudine.*
2. Planta fertilis basi flore masculo instructa.
3. Folium comale.
4. Ejusdem apex areolationem exhibens.
5. Cellulæ apicales.
6. Eadem baseos.
7. Planta capsuligera foliis exsectis.
8. Capsula operculata et calyptrata pedicello e vaginula extracto.
9. Margo capsulæ orificii cum spora.
10. Operculum cum columella adhærente.
- 11, 12. Calyptræ.
13. Caulis primarius, antheridiophorus, demum innovationem fertilem proferens.
14. Folium perigoniale, cum antheridiis et paraphysibus.
- 15, 16. Antheridia et paraphyses.

APHANORHEGMA SERRATUM, *Sulliv.*

Tab. 57.

PLANTÆ humiles, teneræ, annuæ vel bi-triennes, gregariæ, vel cæspitulos laxos pallide virescentes formantes, basi sola radiculosæ.

CAULIS erectus, 3–7 lineas attingens, primo simplex, dein bis terve dichotome innovando-ramosus.

FOLIA mollia, inferiore in caule elongato remota, flexuoso-patula; superiора approximata, erectiuscula, oblongo-et spathulato-lanceolata, brevius acuminata, supra medium serrata, ad apicem usque tenui-costata, laxe hexagono-areolata; cellulis basilaribus majoribus oblongis rectangulis, marginalibus sæpe luteo tinctis.

FLORES monoici et synoici: antheridiis 6–12 fasciculatis nudis vel uno alterove folio perigoniali minimo comitatis in comalium axillis rarius ad vaginulæ basin positis; paraphysibus longioribus apice maxime globoso-inflatis.

CAPSULA immersa, brevissime pedicellata, sphærica, vertice minute papillata, in medio rima haud discolore valde obscura circumcisse dehiscens; calyptra conico-mitræformi 5–6-lobata vix ad operculi medium porrecta; sporis tuberculatis.

APHANORHEGMA SERRATUM, *Sulliv.* in *Mem. Amer. Acad. n. ser.* 4, p. 60, t. 2; *Mosses U. States*, p. 52, t. 4; *Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc.* (ed. 1), No. 154.

SCHISTIDIUM SERRATUM, *Hook. & Wils.* in *Drumm. Musc. Amer. Coll.* 2, No. 20; *Sulliv. Musc. Alleghan.* No. 198.

PHYSCOMITRIUM SERRATUM, *C. Müll. Synop. Musc.* 2, p. 545.

HAB. Damp ground, river-banks, shaded roadsides, &c., New Jersey, Pennsylvania, and Western Missouri.—Not uncommon.

Nearly allied to *Physcomitrella patens*, from which, indeed, it is separated by scarcely any other character than its operculated capsule with a thicker and firmer external wall.

Its inflorescence excludes it from *Physcomitrium*.

TAB. 57. — APHANORHEGMA SERRATUM.

1. Plantæ naturali magnitudine.
2. Planta.
3. 4. Folia caulina.
5. Areolatio folii apicis.
6. Eadem folii baseos.
7. Sectio transversalis folii.
8. 9. Capsulæ.
- 10, 11. Calyptræ.
12. Archegonium.
13. Inflorescentia.
- 14, 15. Antheridia et paraphyses.

TETRAPLODON AUSTRALIS, *Sulliv. & Lesqx.*

Tab. 58.

PLANTÆ teneræ, graciles, tomento radiculoso intertextæ, in cæspitulis compactis superne læte viridibus inferne fuscescentibus congestæ.

CAULIS uncialis, brevior vel longior, simplex vel parce fastigiat-ramosus.

FOLIA mollia, dissita, erectiuscula, elongato-lanceolata, longe tenui-acuminata, remote grosse serrato-dentata, interdum fere pinnatifida, rarius subintegra; costa cum apice desinente; reti laxissimo oblongo-hexagono.

FLORES dioici et monoici: flos masculus discoideo-capituliformis, conspicuus, in planta distincta graciliore terminalis, vel gemmæformis in plantæ fertilis foliorum axillis; floris terminalis perigonialibus 4–6, e basi late ovata erecta repente lineali-attenuatis subhorizontalibus; antheridiis et paraphysibus subclavæformibus, numerosissimis.

CAPSULA oblongo-ovalis, parvula, apophysi sporangio paululum latiore et longiore in pedicellum 3–5-linearem crassum sensim defluente instructa, laxius areolata, cellulis orificii marginalibus subquadrato-rotundis nec (ut in *T. angustato*) transversim oblongis; peristomii dentibus binatim conjunctis haud demisse insertis; calyptra elongato-conica, basi haud fissa, operculum hemisphærico-conicum obtuse apiculatum vix tegente.

TETRAPLODON AUSTRALIS, Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 151; Sulliv. Mosses U. States, p. 53, t. 4.

SPLACHNUM SETACEUM, Hook. & Wils. in Drumm. Musc. Amer. Coll. 2, No. 27, nec Michx., ejus planta ad *Tetrap. angustatum* referenda est.

SPHAGNUM foliis tenuibus, etc., Dill. Hist. Musc. t. 85, f. 15, p. 550.

HAB. Swamps near the sea-coast, Florida to New Jersey.

Small forms of *Tetraplodon angustatus* B. & S., and *Splachnum ampullaceum* Linn., closely resemble this species. The first, however, has a dimidiate calyptra, extending to the base of the sporangium, and only a monoicous inflorescence; the second has broader and less attenuated leaves, narrowed at the base, and an exserted capitate columella in the dried capsule: in both the apophysis of the capsule is much larger, particularly in the last, where it is of a deep purple color.

TAB. 58. — TETRAPLODON AUSTRALIS.

1. Plantæ naturali magnitudine.
2. Planta cum inflorescentia monoica.
- 3, 4. Folia.
- 5, 6. Areolatio basilaris et apicalis folii.
7. Capsula apophysata, pedicellus, et vaginula.
8. Sectio transversalis pedicelli.
9. Peristomium.
10. Ejusdem duo dentes adhærentes.
11. Calyptra.
12. Operculum.
13. Flos masculus axillaris.
14. Antheridia et paraphyses.

FONTINALIS BIFORMIS, *Sulliv.*

Tab. 59, 60.

PLANTÆ fluitantes, sola basi ima radicanter, juniores e viridi lutescentes, seniores luride virides.

CAULIS pedalis et longior, tenuis, flexilis, ramosissimus, ramis ramulisque flexuosis elongatis.

FOLIA laxè incumbētia, indistincte trifaria, dimorpha; vernalia ampla mollia late ovato-lanceolata concava acuta vel obtusiuscula, æstivalia (illis delapsis) multo minora angustiora convolutacea rigida ramulos novellos vestientia; areolatione media foliorum vernalium lineari, apicali latiore brevior rhombea sphagniformi, basilari ad parvas auriculas decurrentes multo majore quadrato-oblonga.

FLORES dioici; femineis rarissimis ad caulis basin positis; masculis longius stipitatis.

CAPSULA oblongo-ovalis vel subcylindrica, perichætialibus apice ætate erosis arcte circumvestita, pachyderma; perist. dentibus lineali-lanceolatis, 18–20-articulatis, ciliis solo apice tessellatim conjunctis ceterum liberis appendiculatis, utrisque granuloso-papillois; operculo conico-rostrato; calyptra elongato-conica basi lacera.

FONTINALIS BIFORMIS, *Sulliv. Mosses U. States*, p. 54; *Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc.* (ed. 1), No. 226^b and 226^c.

Forma vernalis. — F. DISTICHA var., *Musc. Alleghan.* No. 191; *PILOTRI-CHUM SPHAGNIFOLIUM*, C. Müll. *Synop.* 2, p. 150.

Forma æstivalis. — F. DISTICHA var., *Musc. Alleghan.* No. 192; *PILOTRI-CHUM DISTICHUM*, C. Müll. *Synop. Musc.* 2, p. 150, ex parte.

HAB. Woodland rivulets, Columbus, Ohio.

Besides other characters less striking, such as the rostrate operculum and the long-stipitate male flower, the prominent

peculiarity of this species is the change which takes place in its foliage, its vernal leaves being replaced in summer by others of a different size, form, and texture.

TAB. 59, 60. — FONTINALIS BIFORMIS.

1. Planta vernalis.
2. Pars ejusdem ad æstivalem transiens.
3. Planta æstivalis, *naturali magnitudine*.
4. Pars plantæ masculæ.
5. Flos femineus.
6. Idem perichætialibus exterioribus exsectis.
7. Folia perichætialia.
- 8, 9. Flores masculi.
10. Folium perigoniale.
11. Antheridium.
- 12, 13, 14, 15. Folia plantæ vernalis.
- 16, 17, 18, 19. Areolatio folii vernalis.
20. Sectiones transversales ejusdem.
- 21, 22, 23. Folia plantæ æstivalis.
24. Capsula operculata et calyptrata in perichætialibus immersa.
25. Eadem sine calyptra.
26. Eadem deoperculata.
27. Capsula deoperculata cum ramulo perichætiali.
28. Folium perichætiale.
29. Basis capsulæ cum pedicello e ramulo perichætiali extracto.
30. Peristomii particula.
31. Operculum.
32. Calyptra.

FONTINALIS LESCURI, *Sulliv.*

Tab. 61, 62.

PLANTÆ fluctuantes, formis vernalibus præcedentis speciei simillimæ, colore plerumque e viridi sericeo-aurescente.

CAULIS pedalis et ultra, laxius foliosus, multoties divisus, divisionibus vage vel versus apicem subpinnatim ramulosis.

FOLIA nullatenus biformia erecto-patentia, haud manifeste trifaria, elongato-lanceolata, concava, mollia, basi amplexicaulia, apice lenissime serrulata; cellulis mediis minutis flexuoso-linearibus, apicalibus brevioribus latioribus, illis ad basis angulos multo majoribus oblongis subventricosis.

FLORES dioici: feminei sat numerosi prope caulis basin siti; antheridiis 6–10, cum paraphysibus longioribus 10–12 septatis.

CAPSULA brevi-cylindræa, tenui-membranacea, perichætialibus internis primum ultra operculum maturum porrectis demum ætate eroso-abbreviatis arcte involuta; peristomii granuloso-papilloso dentibus apice binatim coadunatis 20–25-articulatis, ciliis superne trabeculato-connexis inferne liberis appendiculatis; operculo elongato-conico; calyptra generis.

FONTINALIS LESCURI, *Sulliv. Mosses U. States*, p. 54; *Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc.* (ed. 1), No. 228.

VAR. β . RAMOSIOR; ramulis magis elongatis flexuosis; foliis angustioribus confertioribus minus patentibus capsula operculoque longioribus; dentibus peristomialibus remotius articulatis. Facile in formam typicam per intermedias remanans.

VAR. γ . GRACILESCENS; minor, tenuior, *F. disticham* valde referens, distinctissima tamen capsula plane alia.

HAB. Falls of Little River, Lookout Mountain, Alabama, *Lesquereux*. Saco River, White Mountains, New Hampshire, *James*. — VAR. β . Cheshire County, New Hampshire, *Eaton*. Brattleborough, Vermont, *Frost*. — VAR. γ . Providence, Rhode Island, *Olney*. Wilmington, Delaware, and New Hampshire, *James*. New Jersey, *Austin*.

The absence of deformity in its leaves, aside from other and less obvious characters, at once distinguishes this species from the preceding, the vernal form of which it much resembles.

F. Lescurii is separated from *F. squamosa* (which has not yet been found in this country, and the place of which it seems here to supply) by its reddish stems, and bright green, fulvous, glossy leaves, of a larger size and softer, as well as thinner texture; smaller, cylindrical, thin-walled capsule; imperfect inner peristome; and longer perichaetial leaves.

F. Dalecarlica, compared with this species, is usually a lustreless, dark-green plant, having stems much more divided, branches and branchlets longer, more slender, and subjulaceous; leaves rigid, smaller, and more crowded; capsule shorter and very thick-walled; operculum depressed-conic; teeth of peristome lacunose along the axis between the fewer (15–16) articulations; and larger spores, about $\frac{1}{900}$ (those of *F. Lescurii* being only about $\frac{1}{1300}$) of an inch in diameter.

The spores of all the other American species yet found in fruit are, like the spores of the European *F. squamosa*, of the same size as those of *F. Lescurii*, except in the case of *F. antipyretica*, where they are smaller, having a diameter of only about $\frac{1}{1500}$ of an inch.

TAB. 61. — *F. LESCURI*.

1. Planta feminea.
2. Pars pl. masc. *nat. mag.*
- 3, 4. Folia caulina.
- 5, 6. Rete apicis et baseos.
- 7, 8. Capsulæ in perichætiis.
9. Capsula operculata.
10. Eadem deoperculata.
11. Folium perichætii.
12. Particula peristomii.
13. Flos masc. et perigoniale.
14. Antherid. et paraphysis.

TAB. 62. — *F. LESCURI*, var. β .

1. Planta feminea.
2. Planta masc. *nat. mag.*
3. Folium caulinum.
- 4, 5. Rete ejusdem.
6. Sectio transversalis folii.
- 7, 8. Capsulæ in perichætiis.
9. Capsula operculata.
10. Folium perichætii.
- 11, 12. Partes peristomii.
13. Calyptra.
- 14, 15. Genitalia mascula.

FONTINALIS DISTICHA, *Hook. & Wils.*

Tab. 63, 64.

PLANTÆ graciliores, habitu coloreque formis minoribus antecessantis simillimæ.

CAULIS 7–10-uncialis, tenuis, inferne defoliatus, rigidulus, elasticus, pinnatim et sub-bipinnatim ramulosus, ramulis remotiusculis late patentibus breviusculis substrictis.

FOLIA tenerrima, indistincte trifaria, laxe incumbentia, anguste lanceolata, sensim longe acuminata, modice concava, apice lenissime serrulata, reti tenui-vermiculari.

FLORES dioici: masculi numerosissimi; antheridiis longius pedicellatis.

CAPSULA gracilis, elongato-cylindracea; peristomii granuloso-papilloso dentibus linearibus 14–15-articulatis inter articulationes plus minus pertusis; ciliis superne clathratis inferne liberis appendiculatis; calyptra et operculo *F. Lescurii*.

FONTINALIS DISTICHA, Hook. & Wils. in Drumm. Musc. Amer. Coll. 2, No. 151; Sulliv. Musc. Alleghan. No. 190; Mosses U. States, p. 54; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 227.

PILOTRICHUM DISTICHUM, C. Müll. Synop. Musc. 2, p. 150 (excl. Syn. *F. disticha* var., Sulliv. Musc. Alleghan. No. 192).

VAR. β . TENUIOR; caule ramulisque elongatis flexilibus; foliis angustioribus rigidioribus convolutis laxius areolatis; dentibus peristomialibus lanceolato-subulatis vix lacunosis crebrius articulatis.

HAB. Louisiana, *Drummond*. — Var. β . Southern Kentucky, *Lesquereux*.

A well-marked species, readily distinguished from its congeners by its slender and delicate habit, and by its long and narrow capsule.

F. Lescurii var. *gracilescens* resembles this species, but has a much shorter capsule.

TAB. 63. — FONTINALIS DISTICHA.

1. Planta fertilis *naturali magnitudine*.
2. Pars ramuli.
- 3, 4, 5. Folia caulina.
- 6, 7. Folia areolatio apicalis et basilaris.
8. Capsula operculata perichætialibus inclusa.
9. Capsula operculata cum ramulo perichætiali.
10. Ramulus perichætialis vaginula membranacea aductus.
11. Basis capsulæ.
12. Folia perichætii.
13. Peristomium.
14. Particula ejusdem.
15. Operculum.
16. Calyptra.

TAB. 64. — FONTINALIS DISTICHA, var. β .

1. Planta fertilis.
2. Pars plantæ masculæ *naturali magnitudine*.
3. Pars ramuli.
- 4, 5. Folia.
- 6, 7, 8. Folia areolatio basilaris apicalis et media.
9. Sectiones transversales folii.
10. Capsula deoperculata vetusta.
- 11, 12. Capsulæ vix maturæ perichætialibus inclusæ.
- 13, 14, 15. Folia perichætii.
16. Peristomii duo dentes, ciliis ætate destructis.
17. Calyptra.
18. Flos masculus.
20. Antheridium cum paraphysi.

FONTINALIS NOVÆ ANGLIÆ, *Sulliv.*

Tab. 65.

Majuscula, formis vernalibus *F. biformis* haud dissimilis, diversa tamen caule rigidiore elastico distanter et rectangule pinato-ramuloso, ramis breviusculis, foliis confertioribus firmiusculis pro more læte viridibus densius areolatis neutiquam dimorphis, floribus masculis (in planta propria) solitariis vel 2-4-aggregatis, femineis valde numerosis in axillis omnium fere foliorum sitis. Fructus et perichætium ab *F. biformis* illis vix discrepant.

FONTINALIS NOVÆ ANGLIÆ, Sulliv. Mosses U. States, p. 104; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 225.

HAB. New Haven, Connecticut, *Eaton*. Rockport, Massachusetts, *James*. Smithfield, Rhode Island, *Olney*. Catskill Mountains, New York, *Lesquereux*. New Jersey, *Austin*.

TAB. 65. — FONTINALIS NOVÆ ANGLIÆ.

1. Planta fertilis *naturali magnitudine*.
2. Pars caulis capsulam gerentis.
3. Folium caulis.
- 4, 5, 6. Areolatio folii.
- 7, 8, 9. Sectiones transversales folii.
10. Capsula operculata perichætialibus inclusa.
11. Folium perichætii.
12. Capsula operculata cum ramulo perichætiali.
13. Peristomii particula.
14. Dens a latere visus.
15. Operculum calyptra inclusum.

FONTINALIS ANTIPYRETICA, VAR. GIGANTEA.

Tab. 66.

Differt a forma vulgariore statura multo majore, caulibus parcius ramulosis inferne minus denudatis, foliis arete imbricatis viridi-lutescentibus vel aurescenti-rubiginosis vix unquam nigrescentibus, capsula pro plantæ magnitudine minore, operculo breviori obtusiori, peristomii minus granuloso-papilloso dentibus latioribus brevioribus minus crebre articulatis, ciliisque solam apicem versus clathratis.

FONTINALIS GIGANTEA, Sulliv. Mosses U. States, p. 104; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 224.

FONTINALIS EATONI, Sulliv. in Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 224? fructu adhuc ignoto.

HAB. White Mountains, New Hampshire, *Oakes, Tuckerman, James*. Brattleborough, Vermont, *Frost*. Alleghany Mountains, Pennsylvania, *Porter, Green, Lesquereux*. New Jersey, *Austin*.

TAB. 66. — FONTINALIS ANTIPYRETICA.

1. Planta feminea.
2. Ramulus plantæ masculæ *naturali magnitudine*.
- 3, 4. Folia caulina et ramulina.
- 5, 6, 7. Areolatio folii.
8. Folia sectiones transversales.
9. Capsula calyptrata perichætialibus obducta.
10. Eadem operculata cum pedicello e ramulo perichætiali extracto.
11. Peristomium.
12. Particula peristomii.
13. Eadem dentis peristomialis.
14. Dens peristomii a latere visus.
15. Pars cilia peristomii interni.
16. Operculum.
17. Calyptra.

CRYPHLÆA GLOMERATA, *Schimp.*

Tab. 67.

PLANTÆ cryptothecæ, tenellæ, rigidiusculæ, in cæspitibus laxis elasticis viridi-flavescentibus degentes.

CAULIS primarius arcte repens, ætate defoliatus; secundarii fertiles subunciales, julacei, simplices vel parcellissime ramulosi.

FOLIA sicca conferte imbricata, madida patentissima, ovato-elliptica, subito brevius acuminata, concava, margine recurva, densius areolata; cellulis prominulis, mediis et apicalibus ovalibus vel elongato-ellipticis, angularibus minoribus subquadratis; costa (in icone omissa) ad medium producta: perichætialia continuo-costata, inferiora minuta ovata, cetera multo majora, media late lanceolata, superiora oblongo-obovata apice rotundata tenuitexta, costa superne incrassata excedente cuspidata.

FLORES monoici: feminei sæpius versus caulis secundarii apicem glomerati; masculi axillares gemmæformes; perigonalibus 4–5 ovatis; antheridiis 3–5 eparaphysatis.

CAPSULA ovato-oblonga, leptoderma, brevissime pedicellata, perichætio sessili axillari immersa; peristomio duplici punctulato albescente, dentibus lineali-lanceolatis indistincte remotiusque articulatis, ciliis filiformibus brevibus; annulo specioso composito; operculo e basi depresso-convexo breviter rostrato; calyptra conica latere fissa basi 2–3-incisa, apice scabra.

CRYPHLÆA GLOMERATA, Schimp. in litt.; Bryol. Europ.; Sulliv. Mosses U. States, p. 56, t. 5; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 230.

CRYPHLÆA FILIFORMIS, Sulliv. Musc. Alleghan. No. 81, nec. Hedw.

DALTONIA HETEROMALLA, var., Hook. & Wils. in Drumm. Musc. Amer. Coll. 2, No. 99.

PILOTRICHUM HETEROMALLUM, var. FILIFORME, C. Müll. Synop. Musc. 2, p. 168.

HAB. Trees, Southern States.

More slender than the European *C. heteromalla*, with branches more terete, crowded spreading leaves, much shorter peristome, and larger spores, $\frac{1}{900}$ of an inch in diameter, those of *C. heteromalla* being only $\frac{1}{1500}$.

TAB. 67. — CRYPHÆA GLOMERATA.

1. Plantæ naturali magnitudine.
2. Pars rami cum perichætio capsulam includente.
- 3, 4, 5, 6. Folia ramea (false ecostata depicta).
7. Areolatio folii baseos.
- 8, 9. Eadem folii apicis.
10. Sectiones transversales folii.
11. Capsula operculata et pedicellata, cum ramulo perichætiali.
12. Perichætium capsulam includens.
13. Folium intimum perichætii.
14. Peristomium.
15. Pars ejusdem dentes, cilia annulum et sporas monstrans.
16. Calyptra.
17. Operculum.
18. Flos masculus.
19. Perigoniale cum antheridio.
20. Pars rami exsiccati.

CRYPHÆA NERVOSA, *Hook. & Wils.*

Tab. 68.

Præcedente tenuior gracilior, instructa foliis angustioribus minus confertis continuo-costatis, capsula brevior suburceolata, annulo angustiore simplici, perichætii laxioris foliis supremis lanceolatis dorso apicem versus papillosis, etc.

DALTONIA NERVOSA, Hook. & Wils. in Drumm. Musc. Amer. Coll. 2, No. 100.

CRYPHÆA NERVOSA, Sulliv. Mosses U. States, p. 56.

PILOTRICHUM NERVOSUM, Müll. Synop. Musc. 2, p. 169.

HAB. Trees, Louisiana, *Drummond.* Alabama, *Robinson.*

TAB. 68. — CRYPHÆA NERVOSA.

1. Planta *naturali magnitudine.*
2. Ramus fructiger.
3. Pars rami exsiccati.
- 4, 5, 6. Folia ramea.
7. Areolatio folii baseos.
8. Eadem folii apicis.
9. Sectio transversalis folii.
10. Capsula operculata, calyptrata, pedicellata, cum ramo perichætiali.
11. Capsula peristomata.
12. Perichætium capsulam includens.
13. Folium perichætiale.
14. Ejusdem apex dorso papillosus.
15. Peristomii dentes et cilia cum sporis.
16. Operculum cum adhærente annuli particula.
17. Particula annuli.
18. Calyptra.
19. Operculum et calyptra.
20. Gemmæ masculæ.
21. Perigoniale.
22. Antheridia.

LEUCODON JULACEUS (*Hedw.*), *Schwægr.*

Tab. 69.

PLANTÆ præcedenti generi vegetandi modo similes, saturate virides, ætate sordide flavescentes.

CAULIS primarius tenuis, rhizomatoideus, defoliatus, ramos numerosissimos tereti-foliosos subunciales proferens.

FOLIA conferta, siccitate dense imbricantia, madore subhorizontalia, ovata-elliptica, breviter acuminata, concava, margine recurva, ecostata, minute rotundo-vel ovali-areolata: perichætalia longe exserta, superiora lineari-oblonga, tenui-acuminata, convoluta, ad capsulæ basin fere porrecta.

FLORES dioici: feminei versus ramorum apicem positi: masculi numerosi; antheridiis longe pedicellatis paraphysatis.

CAPSULA turgide ovalis, microstoma, exserta, castanea; peristomio duplici, externo e dentibus linealibus albidis punctulatis apice fissis, interno e membrana tenerrima truncata angusta; operculo conico brevius obliquo-rostrato; calyptra ampla cuculliformi basi subplicata pedicelli apicem amplexante.

PTERIGYNANDRUM JULACEUM, Hedw. Musc. Frond. 4. p. 51, t. 20.

HAB. On trees. — Very common.

TAB. 69. — LEUCODON JULACEUS.

- | | |
|---------------------------------|-----------------------------|
| 1. Planta feminea. | 11. Calyptra. |
| 2. Ramus masc. <i>nat. mag.</i> | 12. Capsula cum perichætio. |
| 3. Ramus fertilis. | 13. Folium perichætii. |
| 4. Pars rami sicci. | 14. Peristomium. |
| 5, 6. Folia ramea. | 15. Pars ejusdem. |
| 7, 8. Rete basis et apicis. | 16. Operculum. |
| 9. Sectiones trans. folii. | 17. Flos masculus. |
| 10. Capsula calyptrata. | 18, 19. Genitalia mascula. |

LEUCODON BRACHYPUS, *Brid.*

Tab. 70.

Differt a proximo *L. julaceo*, statura majore, foliis homomallis curvulis plicato-striatis minus confertis, perichætii laxioris inflati foliis capsulam oblongiorem superantibus, etc.

LEUCODON BRACHYPUS, *Brid. Bryol. Univ.* 2, p. 211.

NECKERA BRACHYPUS, *C. Müll. Synop. Musc.* 2, p. 108.

HAB. Trees. — Common in mountainous districts.

TAB. 70. — LEUCODON BRACHYPUS.

1. Plantæ femineæ et masculæ *naturali magnitudine.*
2. Pars rami cum fructu.
3. Apex rami sicci.
- 4, 5. Folia ramea.
- 6, 7. Folia baseos et apicis areolatio.
8. Cellulæ.
- 9, 10. Sectiones transversales folii.
11. Capsula et perichætium.
12. Folium perichætiale.
13. Particula peristomii.
14. Calyptra operculum includens.
15. Operculum.
16. Flos masculus.
17. Antheridium cum paraphysi.

LEPTODON TRICHOMITRION (*Hedw.*), *Brid.*

Tab. 71.

PLANTÆ mediocres, rigidiusculæ, cæspites latos elasticos e flavescente virides efficientes.

CAULIS primarius filiformis, defoliatus, arcte repens, caules secundarios 1–2 unciales subpinnatim brevi-ramulosos copiose exserens.

FOLIA conferta, erecto-patentia, ovato-lanceolata, longius acuminata, concava, margine recurva, plus minus plicato-implana, ecostata, minute areolata; areolis oblongis vel fusiformibus, marginalibus præcipue versus basin minoribus subquadratis: folia perichætii exserti laxius texta; superiora elongata, vaginantia, tenui-acuminata, ultra capsulæ basin porrecta.

FLORES monoici: masculi gemmacei axillares; antheridiis paucis eparaphysatis.

CAPSULA oblongo-vel ovato-cylindracea in pedicellum sui longitudinis omnino perichætio occultum sensim defluens, leptoderma, exannulata; peristomii externi dentibus sedecies lanceolato-linearibus albidis remotius articulatis haud raro in linea divisurali hic illic pertusis, interne membrana tenuissima lata truncata interdum libera ac integra pro more dilacerata dentiumque faciei internæ adhærente; operculo conico longius rostrato; vaginula pilis longissimis e perichætio eminentibus obsita; calyptra pilosa.

LEPTODON TRICHOMITRION, Mohr. Obs.; Sulliv. Musc. Alleghan. No. 88; Mosses U. States, p. 57.

LASIA TRICHOMITRION, Brid. Bryol. Univ. 2, p. 201.

PTERIGYNANDRUM TRICHOMITRION, Hedw. Sp. Musc. p. 82, t. 16.

VAR. IMMERSUS; statura minore; foliis latioribus; perichæatialibus brevius acuminatis; capsula subimmersa; peristomii dentibus densius articulatis, etc.

LEPTODON IMMERSUS, Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 234.

HAB. Trees, rarely on rocks, Northern and Middle States.
The variety in the Southern States.

TAB. 71. — LEPTODON TRICHOMITRION.

1. Plantæ *naturali magnitudine*.
2. Pars caulis secundarii.
3. Folium.
- 4, 5. Rete folii basilare et apicale.
- 6, 7. Sectiones transversales folii.
8. Capsula operculata et pedicellata, cum vaginula pilis longissimis instructa.
9. Eadem cum perichætio et calyptra pilosa.
10. Folium perichætiæ.
11. Peristomium.
12. Peristomii dentes tres membrana interna marginati.
13. Sectio verticalis peristomii.
14. Gemma mascula.
15. Antheridium.
16. Folium perigoniale.

LEPTODON OHIOENSIS, *Sulliv.*

Tab. 72.

Recedit a præcedente habitu graciliore, caulibus secundariis julaceis minus ramulosis, foliis brevioribus latioribus humectis horizontalibus subrotundo-areolatis costa supra medium evanida instructis; capsula et operculo brevioribus, etc.

LEPTODON OHIOENSIS, Sulliv. Musc. Alleghan. No. 89; Mosses U. States, p. 57; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 235.
NECKERA OHIOENSIS, C. Müll. Synop. Musc. 2, p. 93.

HAB. On trees, Central Ohio.

TAB. 72. — LEPTODON OHIOENSIS.

1. Plantæ *naturali magnitudine*.
2. Pars caulis secundarii.
- 3, 4, 5. Folia.
- 6, 7. Folia basis et apex areolata.
- 8, 9, 10. Sectiones transversales folii.
11. Capsula operculata calyptrata et pedicellata, cum foliis perichætialibus.
12. Folia perichæti.
13. Eadem ac fig. 11, calyptra excepta.
14. Calyptra pilosa.
15. Operculum.
16. Flos masculus et folium perigoniale.

ALSIA ABIETINA (*Hook.*), *Sulliv.*

Tab. 72^b.

PLANTÆ speciosæ, frondiformi-pinnatæ, cæspites extensos rigidos laxos saturate virides formantes.

CAULIS secundarius e primario rhizomatoideo 2–5 uncias longus, firmus, elasticus, inferne simplex, superne pinnato-rarius bipinnato-ramulosus, frondiformis, siccitate circinatim retrocurvus, itaque capsulas omnino occultans, paraphylliis multiformibus.

FOLIA ramulina quinquefariam imbricata, erecto-patentia, lanceolata, obtusiuscule acuminata, carinato-concava, dorso dimidii superioris brevi-papillosa, papillis sursum directis, marginibus inferne recurvis, superne serrulatis infraque apicem leviter inflexis; costa sub apice evanescente; retis pellucidi areolis minutis, superioribus ovali-rhombeis, mediis longioribus, angularibus quadratis numerosis densioribus: folia perichætii elongati turgidi imbricantia; interiora oblonga seu obovato-oblonga, recurvo-apiculata; exteriora minora, late obovata, tenui-acuminata; omnia costæ loco stria tenui flavescente quandoque excentrica ultra medium instructa.

FLORES dioici: feminei brevi-paraphysati, approximati in soli caulis dorso: masculi numerosi, conspicui, caulem ramulosque occupantes; antheridiis 15–20 copiose paraphysatis.

CAPSULA ovato-oblonga, in pedicello perbrevis fere toto perichæatialibus involuto erecta, leptoderma, primo olivacea erythrostroma, demum rutilans nitida, sicca prominenter costata; vaginula elongata membranula tubiformi adaucta; peristomii albescentis granulosi dentibus lanceolato-subulatis nodoso-articulatis, ciliis firmis carinatis dentes æquantibus, inter articulationes prominulas plerumque pertusis, membrana basilari plicata angustissima; ciliolis nullis; annulo composito revolu-

bili; opereulo fere capsulæ æquilongo conico oblique longirostro; calyptra cuculliformi basi lata paulum infra operculum producta glaberrima; sporis luteo-fuscis granulosis $\frac{1}{2000}$ unc. diametro metientibus.

NECKERA ABIETINA, Hook. Musc. Exot. t. 7; Schwægr. Suppl. t. 140; C. Müll. Synop. Musc. 2, p. 142.

PILOTRICHUM ABIETINUM, Brid. Bryol. Univ. 2, p. 258.

LEPTODON CIRCINATUS, Sulliv. in Bot. Pacif. R. R. Survey (Whipple), 4, p. 189, t. 1 (planta mascula).

HAB. On trees, Northwest Coast, *Menzies*. Coast range of mountains, south of San Francisco, California, *Bigelow*, *Bolander*. Vancouver's Island, *Lyall*.

The specimens collected by Menzies, and figured by Hooker and Schwægrichen (l. c.), are unusually elongated and distantly pinnate, owing doubtless to local influences, and therefore do not represent the normal form of the species, as here figured from numerous specimens furnished by other collectors.

This species clearly belongs to *Alsia*, — a genus closely allied to *Leptodon*, — and stands in the same relation to *Leptodon Smithii* that its only congener, *Alsia Californica*, Sulliv. (Crypt. U. States Expl. Exped. Wilkes, p. 25, t. 25), does to *Leptodon trichomitron*.

TAB. 72^b. — ALSIA ABIETINA.

- | | |
|--|-----------------------------------|
| 1. Planta capsuligera. | 11. Capsula cum perichætio. |
| 2. Planta antheridiophora nat. mag. | 12. Capsula exsiccata. |
| 3. Planta exsiccata. | 13. Vaginula et pedicellus. |
| 4. Pars ramuli. | 14. Fol. inter. perichætii. |
| 5. Folium ejusdem. | 15, 16, 17. Particulæ peristomii. |
| 6, 7. Areolatio fol. baseos et apicis. | 18. Operculum. |
| 8. Sectiones transversales folii. | 19. Flos masculus. |
| 9, 10. Paraphyllia. | 20, 21. Antheridia et paraphyses. |

METEORIUM PENDULUM, *Sulliv.*

Tab. 73.

PLANTÆ filiformes, ramosissimæ, longissimæ, pendulæ, laxè intricatæ, flavo-virides.

CAULIS basi brevius subpinnatim ramosa repens, dehinc in ramos 8–10-unciales distanter brevi-ramulosos tenuissimos flexiles dependentes divisus.

FOLIA haud conferta, undique erecto-patentia (illa ramorum baseos majora complanata), lineari-lanceolata, sensim filiformi-attenuata, rectiuscula, firmula, opaca, dorso papillosa, margine serrulato leniter recurva, ad medium usque costata, minute lineari-fusiformi-areolata; areolis ad baseos angulos amplioribus subquadratis: folia perichætii parvula laxa vaginulam longipilam vix tegentia, laxius texta, ceteroquin rameis similia.

FLORES dioici? masculi ignoti; feminei prope ramorum et ramulorum basin positi.

CAPSULA minuta, ovalis, in pedicellum paulo longiorem defluens; peristomii duplicis dilute aurescentis dentibus deltoideo-linealibus remotius nodoso-articulatis plus minus perforatis vel in linea divisurali disruptis, ciliis paululum brevioribus carinatis e membrana plicata latiuscula ortis, ciliolis omnino nullis; operculo conico oblique brevirostro; calyptra juniore elongato-conica; sporis majusculis.

METEORIUM PENDULUM, *Sulliv.* Mosses U. States, p. 81.

HAB. On trees and bushes, Western Louisiana, *Teinturier*, *Riddell*.

Infertile specimens of another species of this genus (probably *M. nigrescens*, *D. & M.*) have been recently found in Florida.

TAB. 73. — METEORIUM PENDULUM.

1. Plantæ *naturali magnitudine*.
2. Pars rami fertilis.
3. Pars rami cum foliis duobus.
- 4, 5, 6, 7. Folia.
8. Areolatio folii baseos.
- 9, 10, 13. Eadem folii apicis.
11. Perichæcium.
12. Folium ejusdem.
14. Capsula operculata cum pedicelli parte.
15. Operculum.
16. Calyptra.
17. Pars peristomii.
18. Dens a latere visus.

ANOMODON OBTUSIFOLIUS, Br. & Sch.

Tab. 74.

PLANTÆ cæspites laxos extensos glaucescenti-virides demum ochraceos formantes.

CAULIS primarius repens, flagellifer, microphyllus; secundarii 1–2-unciales, stricti, simplices, vel semel bisve divisi.

FOLIA bifariam disposita, conferta, e basi ovata subitius ligulato-oblonga, obtusissima, crassa, opaca, utraque pagina dense papillosa, minute rotundato-areolata; costa pellucida sub apice finirente: folia perichætii immersi inferiora minuta, ovata; superiora elongata, vaginantia, longe ligulato-acuminata.

FLORES dioici: feminei e media ramorum parte orti.

CAPSULA ovato- vel elliptico-cylindrica, microstoma, in pedicello mediocri elata, vix ramos superans; peristomii externi dentibus lanceolato-subulatis nodoso-articulatis granulatis, interni ciliis brevissimis e membrana angustissima sæpe abortivis; annulo specioso; operculo conico-rostrato; calyptra cuculliformi.

ANOMODON OBTUSIFOLIUS, Br. & Sch. in Lond. Jour. Bot. 1843, p. 666.

NECKERA VITICULOSA, β . MINOR, Hedw. Sp. Musc. p. 210, t. 48, f. 6–8.

HAB. Trees near watercourses, Middle States. — Common.

TAB. 74. — ANOMODON OBTUSIFOLIUS.

- | | |
|---|--------------------------------|
| 1, 2. Plantæ fem. et masc. <i>nat. mag.</i> | 10. Capsulæ operculatæ. |
| 3. Pars rami. | 11. Peristomium. |
| 4. Folium ejusdem. | 12, 13. Particulæ ejusdem. |
| 5, 6. Areolatio fol. baseos et apicis. | 14. Calyptra. |
| 7. Sectiones trans. folii. | 15. Flos masculus. |
| 8, 9. Perichætium et folia. | 16. Antheridium et paraphysis. |

ANOMODON APICULATUS, *Br. & Sch.*

Tab. 75.

Habitu ramosiore, ramis minus complanato-foliosis, foliis densius areolatis utraque pagina longius papillois basi undulatis auriculatis, auriculis margine spinuloso-papillois, capsula longiore, annuli absentia, etc., facile a *A. obtusifolio* distinguendum.

ANOMODON APICULATUS, Br. & Sch. Bryol. Europ.; Sulliv. Mosses U. States, p. 58; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 237. HYPNUM RUGELII, C. Müll. Synop. Musc. 2, p. 473.

HAB. Decayed logs, in mountainous districts.

TAB. 75. — ANOMODON APICULATUS.

- 1, 2. Plantæ femineæ et masculæ *naturali magnitudine*.
3. Pars rami.
4. Folium ejusdem.
- 5, 6. Areolatio folii baseos et apicis.
7. Sectiones transversales folii.
8. Perichætium.
9. Folium ejusdem.
10. Capsulæ operculatæ.
11. Peristomium.
12. Particula ejusdem.
13. Operculum.
14. Calyptra.
15. Flos masculus.
16. Folium perigoniale.
17. Antheridium et paraphyses.

ANOMODON TOCCOÆ, *Sulliv. & Lesqx.*

Tab. 76, A.

PLANTÆ colore et vegetandi habitu præcedenti similes.

CAULIS primarius prostratus, flagelliformis, defoliatus vel microphyllus, parce radiculosus; secundarii erecti, unciales et ultra, subsimplices vel sæpius irregulariter ramosi, densius foliati, in sicco subcircinati.

FOLIA erecto-patentia, e basi ovata oblonga, acuta, carinato-concava, apicem versus grosse inæqualiter dentata, basi subplicata ibidemque margine revoluta; areolatione pulchra e cellulis minutissimis quadrato-rotundis oblique seriatis composita; costa valida tereti subcontinua superne flexuosa: perichætialia superiora lanceolata, sensim filiformi-attenuata costata. Cætera ignota.

ANOMODON TOCCOÆ, Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 240; Sulliv. Mosses U. States, p. 58.

HAB. On rocks, Toccoa Falls, Northern Georgia, *Lesquereux*.

In the Herbarium of the late Dr. Taylor are specimens marked "*Neckera Nepalensis*, T. T. Mss. Nepal," apparently the same as those from Toccoa Falls, with fruit (imperfect) not unlike that of *A. attenuatus*.

TAB. 76, A. — ANOMODON TOCCOÆ.

1. Planta feminea *naturali magnitudine*.
2. Pars caulis secundarii.
- 3, 4. Folia ejusdem.
- 5, 6. Areolatio.
7. Sectiones transversales folii.
8. Perichætium.
- 9, 10. Folia perichætialia.
11. Archegonium et paraphysis.

PILOTRICHUM CYMBIFOLIUM, *Sulliv.*

Tab. 76, B.

PLANTÆ graciliores, in cæspitibus pallide lutescenti-viridibus laxis extensis degentes.

CAULIS primarius tenuissimus, aphyllus, parce radiculosus, repens, ramos 1–2-unciales simplices subpinnatim vel vage ramulosos proferens.

FOLIA arcte imbricata, in series quinas distinctas spirales disposita, oblongo-lanceolata, cymbiformi-concava, sensim acuta, acumine plana; reti e cellulis minutis pellucidis lineali-oblongis vermicularibus (illis ad baseos angulos subquadratis opacis) exstructo; costa sub apice desinente: perichætialia multo minora, lanceolata, tenuius longe acuminata, haud costata.

FLORES dioici? feminei soli noti; archegoniis paraphysatis. Reliqua desiderantur.

PILOTRICHUM CYMBIFOLIUM, *Sulliv.* Mosses U. States, p. 81; *Musc. Cub.* Wright. in *Proceed. Amer. Acad.* 1861.

HAB. Florida, *Herb. Gray.* Island of Cuba, *Wright.*

TAB. 76 B. — PILOTRICHUM CYMBIFOLIUM.

1. Plantæ naturali magnitudine.
2. Pars rami.
3. Eadem.
4. Folium.
- 5, 6. Rete basilare et apicale.
7. Cellulæ.
8. Sectiones transversales folii.
9. Perichætium.
10. Folium ejusdem.
11. Idem cum perigonio et paraphysi.

LESKEA OBSCURA, *Hedw.*

Tab. 77.

PLANTÆ tenellæ, laxius intricato-cæspitosæ, sordide virides, ætate ochraceæ, valde capsuligeræ.

CAULIS uncialis, prostratus vel ascendens, subpinnatim et inordinate confertim ramosus.

FOLIA caulina et ramea omnino conformia, erecto-patentia, laxius incumbentia, ovata, elongato-ovata, e basi ovata brevius oblongo-acuminata, obtusa vel acutiuscula, concava, margine late leniter recurva, opaca, rotundato-areolata, fere ad apicem usque valido-costata: perichætialia superiora elongata, vaginantia, laxius texta, costata.

FLORES monoici: masculi gemmacei; antheridiis vix paraphysatis.

CAPSULA erecta, elliptico-oblonga, plerumque regularis, tenui-membranacea, ætate rufo-ochracea; pedicello 6–10-unciali; anulo persistente parvulo; peristomii duplicis dentibus linealilanceolatis linea divisurali notatis remotius articulatis, articulis utraque facie prominulis, ciliis tenuibus linealibus, carina lacunosus e membrana angustiore ortis, ciliolis nullis; operculo breviter et obtuse conico; calyptra cuculliformi.

LESKEA OBSCURA, Hedw. Sp. Musc. p. 223, t. 57.

LESKEA GRACILESCENS, Hedw.; Hook. & Wils. in Drumm. Musc. Amer. Coll. 2, No. 106.

LESKEA NERVOSA, Sulliv. Musc. Alleghan. No. 69.

LESKEA MICROCARPA, Schimp. in litt.; Sulliv. Mosses U. States, p. 59.

PTEROGONIUM NERVOSUM, Hook. & Wils. in Drumm. Musc. Amer. Coll. 2, No. 89, nec Schwægr.

HAB. On roots and the lower portion of trunks of trees near water-courses, in low grounds, Middle and Southern States.

A common and variable species, very like *Leskea nervosa*, *Myrin*, of which only sterile specimens have been found in this country, on the mountains of New England. In *L. nervosa* the leaves have a longer and more narrow acumination; the inflorescence also is different, being dioicous.

TAB. 77. — LESKEA OBSCURA.

1. Plantæ naturali magnitudine.
2. Ramus.
3. Pars caulis defoliatus, cum perichaetio et floribus masculis.
- 4, 5, 6, 7, 8, 9. Folia.
10. Folium areolationem monstrans.
- 11, 12. Sectiones transversales folii.
- 13, 14. Capsulæ.
15. Operculum et calyptra.
16. Calyptra.
17. Operculum.
18. Particula peristomii.
19. Sectio verticalis ejusdem.
20. Flos masculus.
- 21, 22. Folia perigonia.
23. Antheridium.

LESKEA DENTICULATA, *Sulliv.*

Tab. 78.

PLANTÆ tenellæ, cæspitulos nitidos læte virides formantes.

CAULIS subuncialis, repens, divisus, radiculosus, vage ramosus ; ramis ramulisque compressiuscule foliosis.

FOLIA conferta, subcomplanata, undique vergentia vel subsecunda, elliptico-lanceolata, brevius tenui-acuminata, tota margine denticulata, concava, ecostata, pellucida, amœne areolata ; areolis minutissimis oblongis, illis angulorum subquadratis.

FLORES dioici ? masculi ignoti.

CAPSULA ovali-oblonga, in pedicello 2-4-lineari erecta, exanulata ; peristomii dentibus lineali-lanceolatis remotius articulatis, interni ciliis dentes fere æquantibus latiusculis in carina hiantibus, ciliolis omnino nullis ; operculo e basi alte conica longius breviusve rostrato ; calyptra cuculliformi majuscula.

LESKEA DENTICULATA, Sulliv. Musc. Alleghan. No. 62 ; Mosses U. States p. 59 ; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 245.

HYPNUM FABRONIÆFOLIUM, C. Müll. Synop. 2, p. 271.

HAB. Base of trees, Middle and Southern States. — Not uncommon, but very seldom in fruit.

TAB. 78. — LESKEA DENTICULATA.

- | | |
|----------------------------------|--|
| 1. Plantæ naturali magnitudine. | 8, 9. Sectiones transversales folii. |
| 2. Planta capsuligera. | 10, 11. Perichætium, folia, etc. |
| 3. Pars rami. | 12. Vaginula, archegonia, et paraphyses. |
| 4, 5, 6. Folia ejusdem. | 13, 14, 15. Capsulæ. |
| 7. Folium areolationem exhibens. | 16, 17. Opercula. |

CLASMATODON PARVULUS (*Hampe*), *Hook. & Wils.*

Tab. 79.

PLANTÆ tenellæ, depresso-cæspitosæ; cæspitibus plus minusve extensis intricatis e flavescenti-viridibus subnitidis.

CAULIS tenuissimus, repens, subpinnatim vel irregulariter ramosus; ramis ramulisque ut plurimum assurgentibus.

FOLIA laxius densiusve imbricantia, erecto-vel subsquarrosopotentia, concava, elongato-ovata, brevius acuminata, superne lenissime serrulata, inferne margine recurva, ad medium unicos-tata, elliptico-areolata; cellulis ad baseos angulos subquadratis: perichætialia elongato-lanceolata, erecta, subvaginantia, ecostata, laxius texta.

FLORES monoici: masculi gemmacei, axillares.

CAPSULA minuta, oblongo-ovalis, in pedicello vix bilineari erecta, leptoderma; peristomio simplici normaliter 16-dentato, dentibus flavescentibus valde irregularibus fragilibus basi dorsali nonnunquam processu uno alterove squamiformi brevissimo instructis plerumque 1-2-fissis, cruribus inæqualibus granulatis remote nodoso-geniculato-articulatis; annulo magno e cellularum serie tri-quadruplici composito persistente vel frustulatum discedente intensius colorato; operculo conico longius oblique rostrato; calyptra dimidiata.

CLASMATODON PARVULUS, (*Hampe*), *Hook. & Wils.*; *Sulliv. Mosses U. States*, p. 60, t. 5; *Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc.* (ed. 1), No. 246.

CLASMATODON PUSILLUS, *Hook. & Wils.* in *Drumm. Musc. Amer. Coll.* 2, No. 80; & in *Lond. Jour. Bot.* 1842, p. 421, t. 25; *Sulliv. Musc. Alleghan.* No. 80.

LESKEA PARVULA, *Hampe* in *Linnaea*, 13, p. 46.

RHEGMATODON PARVULUS, *Hampe*, *Icon. Musc.* t. 14.

HYPNUM PARVULUM, *C. Müll. Synop. Musc.* 2, p. 409.

VAR. RUPESTRIS; cæspite densiore, statura paulo majore, ramis

et ramulis subjulaceo-foliosis, foliis brevioribus latioribus obtusis, capsula latiore, operculo brevior, etc.

CLASMATODON PARVULUS, var. RUPESTRIS, Sulliv. & Lesqx. op. cit. No. 246^b.

HAB. Trunks and branches of trees in dry places: the variety on the base of trees, stones, &c., near the ground, affecting damp situations, Southern States. — Common.

The size of this species, and the form of its leaf, capsule, operculum, etc., are subject to variations, depending mainly on its location.

The var. *rupestris* appears to resemble very closely (if, indeed, it is not the same as) *Anisodon tenuirostris*, *Bryol. Europ.*, found only in the Southern States, and of which we have seen no authentic specimens.

TAB. 79. — CLASMATODON PARVULUS.

1. Plantæ naturali magnitudine.
2. Ramus fructifer.
3. Particula ejusdem cum foliis.
- 4, 5, 6. Folia.
7. Rete folii apicis.
8. Idem baseos.
- 9, 10. Sectiones transversales foliū.
11. Capsula operculata et calyptrata.
- 12, 13, 14. Opercula et calyptræ.
15. Perichætium cum fructu juniore.
16. Folia perichætialia.
17. Particula peristomii.
18. Sectio verticalis ejusdem.
19. Gemma mascula cum folio rameo.
20. Gemma mascula.
21. Antheridium, paraphysis, et folia perigonia.

THELIA HIRTELLA (*Hedw.*), *Sulliv.*

Tab. 80.

PLANTÆ demisso-cæspitantes; cæspitibus densissimis extensis flavescenti-viridibus.

CAULIS 3–10-uncialis, radiculari-tomento obrutus, arcte repans sæpeque ultra cæspitis circuitum longissime porrectus; ramulis erectis confertissimis brevibus 3–5-linearibus teretifoliosis obtusis.

FOLIA dense imbricata, concava, orbiculari-ovata, subito tenui-acuminata, basi decurrentia, dorso scaberrima, superne margine spinuloso-dentata, inferne lobato-ciliata, ciliis longis sursum curvatis plus minus dentatis; reti e cellulis ellipticis dorso papilla unica simplici curvula instructis composito; costa debili ad medium evanescente: perichætalia numerosa laxa, superiora oblongo-lanceolata, tenuiter acuminata, superne ciliis elongatis dentatis fimbriata.

FLORES masculi adhuc ignoti: feminei copiosissimi, cauligeni.

CAPSULA ovato-cylindracea, erecta, symmetrica, leptoderma, microstoma, exannulata; pedicello 3–4 lineas alto; peristomio duplici, exteriore e dentibus sedecem linearibus albescentibus granulatis remotius prominule articulatis, interiore e membrana angusta truncata; operculo conico-rostrato, capsula triplo brevior; calyptra cuculliformi ad capsulæ medium descendente; spores pallide luteolis diametro $\frac{1}{2500}$ unc. metientibus.

THELIA HIRTELLA (*Hedw.*), *Sulliv. Mosses U. States*, p. 60; *Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc.* (ed. 1), No. 247.

PTERIGYNANDRUM HIRTELLUM, *Hedw. Sp. Musc.* p. 89, t. 18, f. 2–6; *Brid. Bryol. Univ.* 2, p. 188.

HYPNUM HIRTELLUM, *C. Müll. Synop. Musc.* 2, p. 468.

HYPNUM JULACEUM, etc., *Dill. Hist. Musc.* p. 322, t. 41, f. 58, pro parte?

HAB. Base of trees, Northern and Middle States: — common: fruits copiously.

TAB. 80. — *THELIA HIRTELLA*.

- | | |
|---|--|
| 1. Planta <i>naturali magnitudine</i> . | 10. Perichæt. pedicelli basin includens. |
| 2. Ramus. | 11. Folium perichætiale. |
| 3, 4. Folia ramea. | 12. Cilium folii. |
| 5. Areolatio folii apicis. | 13. Capsulæ operculatæ cum calyptra. |
| 6. Eadem baseos. | 14. Pars capsulæ cum peristomio. |
| 7. Cellulæ papillis curvulis præditæ. | 15. Particula ejusdem. |
| 8. Sectiones transversales folii. | 16. Sectio verticalis ejusdem. |
| 9. Acumen folii perichætialis. | 17. Operculum. |

THELIA ASPRELLA (*Schimp.*), *Sulliv.*

Tab. 81.

Facile dignoscitur a *T. hirtella*, cui ceterum simillima, colore cæspitis glauco-viridi, foliis toto ambitu longius teneriusque ciliatis, papillis dorso foliorum bifureis (nec simplicibus curvulis), peristomii dentibus longioribus nodoso-articulatis, etc.

THELIA ASPRELLA (*Schimp.*), *Sulliv. Mosses U. States*, p. 60; *Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc.* (ed. 1), No. 248.

LESKEA ASPRELLIA, *Schimp. in Bryol. Europ. Lesk. Monogr.* p. 2.

HYPNUM HIRTELLUM, var. *FURCATUM*, *C. Müll. Synop. Musc.* 2, p. 469.

HAB. Same as the last, and not unfrequently found growing with it.

TAB. 81. — *THELIA ASPRELLA*.

- | | |
|---|--|
| 1. Planta <i>naturali magnitudine</i> . | 10. Folium ejusdem. |
| 2. Ramus. | 11. Capsula operculata. |
| 3, 4, 5. Folia ramea. | 12. Deoperculata peristomium exhibens. |
| 6. Areolatio baseos. | 13. Calyptra immatura. |
| 7. Eadem apicis. | 14. Operculum. |
| 8. Cellulæ ejusdem. | 15. Particula peristomii. |
| 9. Perichætium. | 16. Eadem dentis. |

THELIA LESCURI, *Sulliv.*

Tab. 82.

Priori affinissima ; differt tamen colore e glauco-viridi plumbeo tincto, caule subfasciculatim laxiusque ramoso, ramis longioribus, foliis brevius acuminatis margine haud ciliato-fimbriatis, papillis dorso foliorum 3-4-furcis stellatis, capsula longiore angustiore altius pedicellata, peristomii exterioris dentibus brevioribus minus nodoso-articulatis, interioris membrana lata in processum plus minus distinctos divisa.

THELIA LESCURI, Sulliv. Mosses U. States, p. 60 ; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 249.

HAB. On dry sandy ground in shady woods, never on trees : Southern States.

TAB. 82. — THELIA LESCURI.

1. Planta *naturali magnitudine*.
2. Ramus.
- 3, 4, 5. Folia ejusdem.
- 6, 7. Areolatio folii baseos et apicis.
8. Cellulæ apicales cum papillis stellatis.
9. Sectiones transversales folii.
10. Perichætium.
11. Folium perichætiale.
12. Fimbria ejusdem.
- 13, 14. Capsulæ cum operculis.
15. Peristomium.
16. Calyptra.
17. Operculum.
18. Pars peristomii.

MYURELLA CAREYANA, *Sulliv.*

Tab. 83.

PLANTÆ pusillæ, tenellæ, superne glauco-virides, inferne sordide albescentes, radiculis longis cæspitose intricatæ.

CAULIS tenuis ascendens, stolonifer, fasciculato-ramosus; ramis ramulisque gracilibus tereti-foliosis siccitate fragilibus.

FOLIA laxius incumbentia, patenti-incurva, late ovata, tenuiter elongato-acuminata, cochleariformi-concava, toto ambitu spinuloso-dentata, dorso longius papillosa, basi vix vel brevissime costata; reti amœno e cellulis majusculis pellucidis rhomboideo-ellipticis extus unipapillosis composito: perichætialia laxius texta, vaginantia, lanceolata, longe filiformi-acuminata, grosse dentata.

FLORES dioici: perichætia conspicua fusco-aurantia: perigonia oblonga, majuscula; folia perichætialibus similia sed minus longo-acuminata; antheridia 5–6 cum paraphysibus numerosis brevioribus.

CAPSULA erecta, oblongo-ovalis vel elongato-obovata, macrostoma, in pedicellum tenuem debilem 5–7-linearem sensim defluens; peristomio duplici hypnoideo, dentibus pallide luteolis, ciliolis binatis; annulo duplici subpersistente; operculo breviconico; calyptra fugaci.

MYURELLA CAREYANA, *Sulliv.* Mosses U. States, p. 61, t. 5; *Sulliv. & Lesqx.* Musc. Bor.-Amer. Exsicc. (ed. 1), No. 250.

HAB. Mountains, New England, *Carey*. Pennsylvania, *Lesquereux*. Negro Mountain, North Carolina, *Gray* and *Sullivant*. Brattleborough, Vermont, *Frost*. Helderberg Mountains, New York, *Austin*.

The filiformly apiculate leaves of this species, ciliate-dentate

on the margin and strongly papillose on the back, mainly distinguishing it from the nearly related *M. julacea*.

TAB. 83. — MYURELLA CAREYANA.

- 1, 2. Plantæ femineæ et masculæ *naturali magnitudine*.
3. Planta fertilis.
4. Pars rami foliosi.
- 5, 6. Folia ramea.
- 7, 8. Rete basilare et apicale eorundem.
9. Cellulæ singulæ papilla unica instructæ.
10. Perichætium.
11. Perichætialia.
12. Archegonium.
13. Capsula operculata.
14. Capsulæ absque operculis.
15. Calyptra.
16. Operculum.
17. Particula peristomii.
18. Floŕ masculus.
19. Antheridia et paraphyses.
20. Perigoniale.

FABRONIA WRIGHTII, *Sulliv.*

Tab. 84.

PLANTÆ perpusillæ, delicatulæ, in cæspitulis laxiusculis læte virentibus nitidis degentes.

CAULIS erectus vel decumbens, valde inordinate ramosus, fragilis, stolonifer, longe radiculosus.

FOLIA erecto-patentia, laxa, elongato-lanceolata, sensim subulato-acuminata, concava, ad medium plus minusve distincte costata, margine serrato- interdum subciliato-dentata; areolatione pulchra pellucida majuscula rhomboideo-elliptica, cellulis angularibus numerosis minoribus opacis subquadratis: perichætalia interiora oblonga, subito et brevius acuminata, ecostata, superne grossius serrata.

FLORES monoici: masculi aperto-gemmacei; perigonialibus lanceolatis acuminatis.

CAPSULA erecta, symmetrica, collo magno incluso oblongo-pyriformis, extus e cellulis quadratis flexuosis composita; pedicello 1-2-lineari; peristomio simplici, dentibus 16 per paria approximatis elongato-deltaideis utraque facie planis remote 4-5-articulatis linea axili recta notatis aurantiaceis oblique striolatis apice plus minus bifidis, humectis incurvis, siccis reflexis; sporis diametro $\frac{1}{2300}$ unc. metientibus; operculo conico-apiculato; calyptra dimidiata.

FABRONIA WRIGHTII, Sulliv. Mosses U. States, p. 61; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 251.

HAB. San Marcos, Texas, *Wright*.

Near the European *F. octoblepharis*: but that species has a mamillate operculum, dark brownish-red peristomial teeth,

and leaves with more numerous quadrate cells at their basal angles.

TAB. 84. — FABRONIA WRIGHTII.

1. Plantæ *naturali magnitudine*.
2. Planta fertilis.
- 3, 4, 5, 6. Folia caulina et ramea.
7. Folium rameum areolationem monstrans.
8. Cellulæ ejusdem cum granulis chlorophyllosis.
- 9, 10. Capsulæ cum et sine operculo.
11. Calyptra.
12. Opereulum.
13. Pars capsulæ, parietem externam ejus flexuoso-areolatam et peristomii dentes duos exhibens.
14. Perichætium.
15. Idem cum flore masculo.
16. Folium perichætii.
17. Flos masculus.
18. Folium perigoniale.

FABRONIA RAVENELII, *Sulliv.*

Tab. 85.

Priori forsan nimis affinis; recedit tamen foliis margine subintegris, dentibus peristomialibus brunneis, sporis majoribus diametro $\frac{1}{1500}$ unc. æquantibus, etc.

FABRONIA RAVENELII, Sulliv. Mosses U. States, p. 61, t. 4; Sulliv. & Lesqx.

Musc. Bor.-Amer. Exsicc. (ed. 1), No. 252.

FABRONIA CAROLINIANA, Sulliv. & Lesqx. op. cit. No. 253.

HAB. Decayed logs, Santee Canal, South Carolina, *Ravenel*.

TAB. 85. — FABRONIA RAVENELII.

1. Plantæ *naturali magnitudine*.
2. Planta fertilis.
- 3, 4. Folia ramea in situ.
- 5, 6. Eadem avulsa.
7. Folium ramulinum areolationem totam monstrans.
8. Cellulæ ejusdem cum utriculis primordialibus.
9. Capsulæ.
10. Capsula pedicellata cum perichætio.
11. Folium perichætile.
- 12, 13, 14. Opercula.
15. Calyptra.
16. Pars peristomii.
17. Dens ejusdem.
18. Flos masculus.
19. Folium perigoniale cum antheridio.

FABRONIA GYMNOSTOMA, *Sulliv. & Lesqx.*

Tab. 86.

Præcedentibus similis, sed distinctissima foliis ciliato-dentatis et præsertim capsula eperistomata, ejusdem orificio membrana horizontali clauso.

FABRONIA GYMNOSTOMA, Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 254; Sulliv. Mosses U. States, p. 62.

HAB. Santa Fe, New Mexico, *Fendler*.

TAB. 86. — FABRONIA GYMNOSTOMA.

1. Plantæ *naturali magnitudine*.
2. Planta fertilis.
3. 4, 5, 6. Folia ramea.
7. Folium totum areolatum.
8. Cellulæ ejusdem chlorophyllosæ.
- 9, 10. Capsulæ operculatæ.
11. Epiphragma capsulæ orificii in medio pertusum.
- 12, 13. Opercula.
14. Calyptra.
15. Perichætium.
16. Folium perichætiale.
17. Gemma mascula.
18. Folium perigoniale.
19. Antheridium.

PYLAISÆA SUBDENTICULATA, *Schimp.*

Tab. 87.

PLANTÆ tenellæ, depresso- et implexo-cæspitantes, sericeo-virides.

CAULIS repens, divisus, irregulariter subpinnatim ramulosus, ramulis gracilibus expansis vel ascendentibus.

FOLIA erecto-patentia, haud conferta, ovato-lanceolata, brevius longiusve acuminata, concava, margine lenissime serrulata, ecostata, rhomboideo-elliptico-areolata; cellulis angularibus permultis quadratis subgranulosis: folia perichætialia vaginantia, elongato-lanceolata, laxè texta, tenuiter acuminata.

FLORES monoici; perichætiis aggregatis; perigoniis apertogemmaceis; antheridiis et paraphysibus numerosis.

CAPSULA cylindraceo-oblonga, symmetrica, in pedicello rutilante 5–8-lineari erecta; peristomio duplici, dentibus lanceolato-subulatis sat longe sub orificio orientibus remotius articulatis, articulis utraque facie adque latera prominulis, ciliis dentibus æquilongis carina sæpius diremptis e membrana lata plicata ortis, ciliolis subnullis; operculo e basi conica longius rostrato; calyptra dimidiata.

PYLAISÆA SUBDENTICULATA, Schimp. in Bryol. Europ.; *Sulliv. Mosses U. States*, p. 62.

HAB. On the bark of trees, Central Ohio; rare. New Jersey, *Austin*.

Very near slender forms of *P. polyantha*; distinguished by scarcely any other characters than its shorter-pointed leaves and longer rostrate operculum; and there may be a doubt, since but

very few specimens of it have yet been found, whether it may not ultimately prove to be only a form of that species.

TAB. 87. — PYLAISÆA SUBDENTICULATA.

1. Plantæ *naturali magnitudine*.
2. Ramus.
- 3, 4. Folia ramea.
- 5, 6. Areolatio folii baseos et apicis.
- 7, 8. Capsulæ.
9. Operculum.
10. Calyptra.
11. Portio peristomii.
12. Sectio verticalis ejusdem.
13. Perichætium.
14. Folia perichætialia.
15. Gemma mascula cum folio caulino.
16. Perigoniale, antheridium, et paraphysis.

PYLAISÆA INTRICATA (*Hedw.*), *Schimp.*

Tab. 88.

Statura et habitu *P. subdenticulatæ* similis; distincta tamen colore sericeo-nitente, ramificatione magis pinnato, ramulis adscendentibus recurvatis, foliis angustioribus sensim acuminatis sursum secundis cellulis angularibus quadratis magis numerosis, capsula elongato-subovata turgida microstoma conico-operculata, peristomii interni membrana tenuissima dentibus adglutinata eosque supra medium marginante dehinc libera bartramioidea, sporis luteo-viridibus fere duplo majoribus, etc.

PYLAISÆA INTRICATA, W. P. Schimp. Bryol. Europ.; Sulliv. Mosses U. States, p. 62, t. 4.

PTERIGYNANDRUM INTRICATUM, Hedw. Sp. Musc. p. 85, t. 18; Brid. Bryol. Univ. 2, p. 179.

PTEROGONIUM INTRICATUM, Schwægr. et alii.

HYPNUM INTRICATUM, C. Müll. Synop. Musc. 2, p. 338.

HAB. Bark of trees. — Quite common.

TAB. 88. — PYLAISÆA INTRICATA.

1. Plantæ naturali magnitudine.
2. Ramus.
- 3, 4, 5. Folia ramea.
- 6, 7. Rete folii baseos et apicis.
8. Capsula operculata (forma normalis).
- 9, 10. Capsulæ (formæ rariores).
- 11, 12. Opercula.
- 13, 14. Calyptræ.
15. Peristomium.
16. Pars ejusdem.
17. Perichætium.
18. Folia perichætialia.
- 19, 20. Flores masculi.

PYLAISÆA VELUTINA, *Schimp.*

Tab. 89.

A *P. intricata* quacum olim confusa distinguitur, foliis paululum angustioribus cellulis angularibus quadratis multo paucioribus, capsula longiore subcylindracea longius operculata, dentibus peristomialibus longioribus crebrius articulatis perque totam longitudinem membrana adhærente (perist. int.) hyalino-marginatis, sporis fusco-brunneis granulatis majoribus $\frac{1}{900}$ unc. diam. (illis *P. intricatæ* $\frac{1}{1300}$) metientibus, etc.

PYLAISÆA VELUTINA, Schimp. Bryol. Europ.; Sulliv. Mosses U. States, p. 63.

HAB. Same as the last, and often found growing with it.

TAB. 89. — PYLAISÆA VELUTINA.

1. Plantæ *naturali magnitudine*.
2. Ramus.
- 3, 4, 5, 6. Folia ramea.
- 7, 8. Areolatio basilaris et apicalis folii.
- 9, 10. Cellulæ ejusdem.
- 11, 12. Capsulæ operculatæ cum calyptra.
13. Operculum.
14. Calyptra.
15. Pars peristomii.
16. Perichæetium.
17. Folium perichætii.
18. Flos masculus.
19. Folium perigoniale cum antheridio et paraphysi.

HOMALOTHECIUM SUBCAPILLATUM, *Schimp.*

Tab. 90.

PLANTÆ tenellæ, intricato-cæspitosæ, magnitudine ac vegetandi modo *Pylaisæas* præcedentes valde referentes.

CAULIS prostratus, subuncialis, vage divisus; ramis ramulisque brevibus numerosis adscendentibus subtereti-foliosis.

FOLIA undique erecto-patentia, haud conferta, imbricantia, concava, ovaliâ vel subobovata, repentine longius tenui-acuminata, margine anguste subrecurva serrato-dentata; costa ad medium evanescente; reti e cellulis rhomboideo-ellipticis, illis angulorum numerosis quadratis: perichætialia interiora vaginantia, oblonga, sensim longe acuminata, apice dentata.

FLORES dioici cauligeni: masculi gemmacei; antheridiis paraphysatis.

CAPSULA cylindraceo-oblonga, plus minusve incurva, in pedicellum 4–5-linearem scabrum (in icone false lævem delineatum) defluens; vaginula pilis e perichætio longe eminentibus obsita; perist. ext. dentibus longiusculis sublinealibus dense articulatis basi confluentibus linea divisurali flexuosa notatis cuticulaque dorsali late hyalino-marginatis, perist. int. membrana tenuissima obscura dentibus adhærente, operculo e basi alte convexo-conico longius rostrato; calyptra dimidiata ad mediam capsulam descendente pilis raris longiusculis instructa.

HOMALOTHECIUM SUBCAPILLATUM, Schimp. Bryol. Univ.; Sulliv. Mosses U. States, p. 63, t. 5.

PTERIGYNANDRUM SUBCAPILLATUM, Hedw. Sp. Musc. p. 83, t. 16, f. 9–12.

PTEROGONIUM DECUMBENS, Schwægr. Suppl. t. 110.

PTEROGONIUM ASCENDENS, Schwægr. op. cit. t. 243.

HYPNUM SUBCAPILLATUM, C. Müll. Synop. Musc. 2, p. 352.

HAB. On trees, growing with *Pylaisæa intricata* and *P. velutina*. — Not uncommon.

TAB. 90. — HOMALOTHECIUM SUBCAPILLATUM.

1. Plantæ *naturali magnitudine*.
2. Ramus.
- 3, 4, 5, 6. Folia *ramea*.
7. Sectio transversalis folii.
- 8, 9. Rete basillare et apicale folii.
10. Folia perichætalia in situ, vaginula pilis longe excedentibus obsita, et pars pedicelli.
11. Perichætalia.
12. Capsula operculata et calyptrata.
13. Calyptra.
14. Capsula operculata.
15. Peristomium.
16. Particula ejusdem.
- 17, 18. Opercula.
19. Gemma maseula.
20. Perigoniale, antheridia, et paraphyses.

CYLINDROTHECIUM CLADORRHIZANS, *Schimp.*

Tab. 91.

PLANTÆ speciosæ, complanatæ, compacte lateque depressocæspitosæ, e viridi cum nitore sericeo aurescentes.

CAULIS bi – triuncialis, prostratus, parce divisus, vage subpinatim ramosus, divisionibus ramisque subtus et ex apice fasciculato-radiculosis.

FOLIA densius complanato-imbricata, e basi constricta ovato-lanceolata vel ovato-oblonga, sensim vel subito brevi-acuminata, superne leniter denticulata, basi striis costæformibus brevissimis prædita; reti e cellulis tenuissimis elongatis exstructo, illis ad basis angulos subquadratis pellucidis granulosis: perichætialia numerosa filiformi-attenuata, supra medium squarrosa et varie flexa.

FLORES monoici, cauligeni: masculi aperto-gemmacei; perigonialibus elongato-ovatis; antheridiis paraphysatis.

CAPSULA cylindræcea vel ovato-cylindræcea, in pedicello unciali et ultra rubello erecta; peristomii parvi dentibus lineali-lanceolatis punctulatis, usque ad medium rufo-aurantiis dehinc pallidioribus inque linea divisurali lacunosis, articulis 14–17 circumcirca prominulis, ciliis dentibus æquilongis flavidulis perangustis carinatis; annulo conspicuo composito facile deliscente; operculo conico breviter crasse rostrato; calyptra angusta dimidiata fere ad capsulæ basin descendente.

NECKERA CLADORRHIZANS, Hedw. Sp. Musc. p. 207, t. 47; Brid. Bryol.

Univ. 2, p. 230; C. Müll. Synop. Musc. 2, p. 70.

ENTODON CLADORRHIZANS, C. Müll. in Linnæa, 18, p. 707.

CYLINDROTHECIUM SCHLEICHERI, Bryol. Europ. 5. t. 464.

CYLINDROTHECIUM CLADORRHIZANS (Hedw.), Schimp. Synop. Musc. Europ. p. 514; Sulliv. Mosses U. States, p. 64, t. 5.

HAB. In dry woods, on decayed logs, roots of trees, and the ground. — Very common.

C. cladorrhizans has until recently been considered a native of North America only; but the European *C. Schleicheri* is now admitted to be the same species slightly modified. Of the two plants, Prof. Schimper, in his excellent Synopsis Musc. Europ., says: “*Stirps americana differt notis pluribus ab europæa, sed vix satis gravibus ut specie distinguatur.*”

TAB. 91. — CYLINDROTHECIUM CLADORRHIZANS.

1. Planta fertilis *naturali magnitudine*.
2. Pars rami.
- 3, 4. Folia ramulina et caulina.
- 5, 6. Areolatio basilaris et apicalis eorundem.
7. Perichætium.
8. Folia ejusdem.
- 9, 10. Capsulæ operculatæ.
11. Particula peristomii.
12. Sectio verticalis ejusdem.
13. Operculum junius.
14. Idem cum columella.
15. Calyptra.
16. Flos masculus, perigonialia, antheridium, et paraphysis.

CYLINDROTHECIUM SEDUCTRIX, (*Hedw.*) *Schimp.*

Tab. 92.

PLANTÆ late depresso-cæspitosæ, virides, in apricis aurescentes, nitidæ, maxime fertiles, capsulis onustæ.

CAULIS 2-3-uncialis, procumbens, plus minus pinnato-ramulosus; ramis ramulisque inæqualibus tereti-foliosis radiculis; radiculis atropurpureis fasciculatis.

FOLIA aretius julaceo-imbricantia, oblongo-elliptica, obtusa, brevissime apiculata, profundius concava, plus minus striata, superne lenissime serrulata, tenuia, firma; costa debili gemella brevissima; reti compacto e cellulis minutissimis linearibus, illis ad angulos basilares numerosis brevioribus latioribus subquadratis: perichætialia laxius areolata; inferiora late ovata, patentia; interiora elongato-oblonga, arete vaginantia; omnia brevius tenui-acuminata, subecostata.

FLORES monoici cauligeni: masculi substipitati aperto-gemmaeæ; perigonialibus ovatis; antheridiis paraphysatis.

CAPSULA elongato-cylindræa, e basi sursum lenissime angustata, in pedicello rubello unciali erecta, leptoderma, longitudinaliter substriolata; annulo lato frustulatim labente; peristomii duplicis dentibus remote nodoso-articulatis; operculo conico brevius longiusve rostrato, rostro crasso obtuso; calyptra longa angusta dimidiata.

NECKERA SEDUCTRIX, Hedw. Sp. Musc. p. 208, t. 47; Brid. Bryol. Univ. 2, 231; C. Müll. Synop. Musc. 2, p. 72.

CYLINDROTHECIUM SEDUCTRIX, Bryol. Europ.; Sulliv. Mosses U. States, p. 64.

HAB. On logs, in moist shaded places. Affects more humid situations and fruits more copiously than the last species.
— Not uncommon.

Very near the preceding species; but separated by its somewhat smaller size, terete and more slender branchlets, more concave and shorter apiculate leaves, narrower and more numerous capsules, deeper insertion of the teeth of the peristome, less perfect annulus, &c.

TAB. 92. — CYLINDROTHECIUM SEDUCTRIX.

1. Plantæ *naturali magnitudine*.
2. Ramus.
- 3, 4. Folia caulis et ramorum.
5. Apex folii.
- 6, 7. Areolatio folii bascos et apicis.
8. Capsula deoperculata.
9. Capsula operculata.
10. Pars peristomii.
- 11, 12. Opercula.
13. Calyptra.
14. Perichæcium.
- 15, 16, 17. Folia ejusdem.
18. Gemma mascula.
- 19, 20. Folia perigonia, antheridium, et paraphysis.

CYLINDROTHECIUM COMPRESSUM, *Schimp.*

Tab. 93.

Statura minor, habitus delicatulus, rami ramulique magis complanati, folia breviora latiora magis concava apice obtusiore haud serrulata, perichætialia erecta, capsula minor elongato-elliptica microstoma brevius pedicellata cum operculo longius tenui-rostrato, dentes peristomii lineales multo crebrius articulati, etc. speciem hanc a *C. cladorrhizante* perbelle distinguunt.

LESKEA COMPRESSA, Hedw. Sp. Musc. p. 232, t. 56; Brid. Bryol. Univ. 2, p. 287.

ENTODON COMPRESSUS, C. Müll. in Linnæa, 18, p. 707.

NECKERA COMPRESSA, C. Müll. Synop. Musc. 2, p. 66.

CYLINDROTHECIUM COMPRESSUM, Sulliv. Mosses U. States, p. 64; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 264.

HAB. Trunks of trees near water-courses, Pennsylvania to Missouri. — Rare.

TAB. 93. — CYLINDROTHECIUM COMPRESSUM.

1. Plantæ naturali magnitudine.
2. Ramus.
- 3, 4, 5, 6. Folia.
- 7, 8. Rete basilare et apicale folii.
9. Capsulæ operculatæ.
10. Capsula absque operculo.
11. Particula peristomii.
12. Operculum cum columella.
13. Calyptra.
14. Perichætium.
15. Folia ejusdem.
16. Vaginula cum archegoniis.
17. Flos masculus in folii axilla.
- 18, 19. Perigonialia.
20. Antheridium.

CYLINDROTHECIUM DRUMMONDII, *Schimp.*

Tab. 94.

Quoad staturam habitumque *C. cladorrhizantem* valde referens, a quo tamen facile distinguitur ramis ramulisque magis deplanatis, foliis (ut et perichætialia erecta) apice distincte dentato-serrulatis, capsulæ brevioris collo tumidulo in pedicellum pallidum abrupte continuo, peristomii dentibus lanceolato-subulatis oblique striolatis, annulo subnullo, etc.

CYLINDROTHECIUM DRUMMONDII, Bryol. Europ.; Sulliv. Mosses U. States, p. 64; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 264.

CYLINDROTHECIUM RUGELIANUM, Bryol. Europ.

NECKERA CLADORRHIZANS, Hook. & Wils. in Drumm. Musc. Amer. Coll. 2, No. 264.

HAB. Decayed logs, rocks, &c., Southern States.

TAB. 94. — CYLINDROTHECIUM DRUMMONDII.

1. Planta *naturali magnitudine*.
2. Ramulus.
- 3, 4, 5. Folia.
- 6, 7. Rete apicale et basilare eorundem.
8. Perichætium.
9. Folia ejusdem.
- 10, 11. Capsulæ operculatæ.
12. Pars peristomii.
13. Operculum.
14. Calyptra.
15. Flos masculus.
16. Folia perigonia, antheridium, et paraphysis.

CYLINDROTHECIUM SULLIVANTII, *Schimp.*

Tab. 95.

Præcedentibus tenuius angustius gracilius, caule ramis atque ramulis modice compressis elongatis sæpe apice filescentibus, foliis confertis e basi angusta ovato-oblongis oblongisve sensim brevius acuminatis apice serrulatis, capsula subcylindræa gracili in pedicellum rubellum sensim defluente speciose annulata, operculo longe tenui-rostrato, peristomii dentibus lineali-elongatis crebre nodoso-articulatis subgrammice notatis etc. primo intuitu dignoscendum.

NECKERA SULLIVANTII, C. Müll. Synop. Musc. 2, p. 65 (1850).

CYLINDROTHECIUM GRACILESCENS, Bryol. Europ. (1851).

CYLINDROTHECIUM SULLIVANTII (C. Müll.), Sulliv. Mosses U. States, p. 64; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 263.

HAB. In shady woods, on stones near the surface of the ground, Western North Carolina, *Gray* and *Sullivant*. Tennessee, *Lesquereux*.

TAB. 95. — CYLINDROTHECIUM SULLIVANTII.

1. Planta *naturali magnitudine*.
2. Pars rami.
- 3, 4, 5. Folia.
- 6, 7. Areolatio folii baseos et apicis.
8. Perichætium.
9. Folia ejusdem.
10. Capsulæ cum operculis.
11. Peristomium cum columella emergente.
12. Particula peristomii.
13. Opercula.
14. Calyptra.
15. Flos masculus.
16. Perigonialia, antheridium, et paraphysis.

CYLINDROTHECIUM BREVISETUM, *Schimp.*

Tab. 96.

Inter congeneres Americanos hæc species statim recognoscitur, ramis et ramulis ascendentibus subacutis tereti- (haud compresso-) foliosis, foliis erecto-patentibus confertis concavis lanceolatis sensim longius tenui-acuminatis inferne margine recurvis laxius areolatis, capsula ovato-cylindracea, operculo conico obtuso, pedicello breviusculo pallide luteo, peristomii dentibus hyalino-marginatis, ciliis abortivis, annulo speciosissimo, sporis majoribus, etc.

NECKERA BREVISETA, Wils. in Hook. Jour. Bot. 4, p. 419, t. 24.

CYLINDROTHECIUM BREVISETUM, Bryol. Europ.; Sulliv. Mosses U. States, p. 65.

HAB. Bark of decayed and prostrate trees, Pennsylvania to Missouri. — Somewhat rare.

TAB. 96. — CYLINDROTHECIUM BREVISETUM.

1. Plantæ naturali magnitudine.
2. Pars rami.
- 3, 4, 5. Folia.
- 6, 7. Rete basilare et apicale folii.
8. Sectio transversalis folii.
9. Perichætium.
10. Folia ejusdem.
11. Capsulæ operculatæ.
12. Pars peristomii.
13. Calyptra.
14. Operculum.
15. Flos masculus.
16. Folium perigoniale, antheridium, et paraphysis.

CLIMACIUM AMERICANUM, *Brid.*

Tab. 97.

PLANTÆ speciosæ, dendroideæ, rigidæ, gregariæ vel laxe cæspitosæ, e flavescente virides.

CAULIS secundarius e caule primario rhizomatoideo subaphyllo valde tomentoso-radiculoso erectus, 2–4-uncialis, inferne simplex atque obscure squamoso-foliosus, superne in ramos confertissimos simplices raro ramulosos dissolutus, itaque arbusculam pulchre fingens.

FOLIA ramea et ramulina erecto-patentia, laxius imbricantia, e basi lata auriculis amplis undulatis prædita lanceolata, concava, superne grosse serrata, longitrorsum pluries plicata; costa sub apice evanescente; reti e cellulis exilissimis elongato-rhomboides (illis auricularum subrotundis) exstructo; paraphylliis numerosis simplicibus et ramosis; perichætalia recta, arcte vaginantia, elongata, tenui-acuminata, ecostata, laxius areolata.

FLORES dioici quandoque (ut in icone) anormaliter monoici: plantæ masculæ fertilibus similes rarissimæ; floribus masculis aperto-gemmaceis polyphyllis numerosis, ad caulis apicem ramulorumque basin sitis.

CAPSULÆ aggregatæ, e caulis apice et ramulorum basi ortæ, elongato-cylindraceæ, rectæ vel leniter curvulæ, in pedicellis mediocris tenuibus erectæ, basi attenuatæ, exannulatæ; peristomii externi dentibus e basi lanceolata brevi subito longe subulatis dorso linea flexuosa notatis 35–40 articulatis rufo-aurantiis granulosis, interni ciliis dentes æquantibus linealibus perangustis carina primum inter articulationes lacunosis ætate per totam fere longitudinem hiantibus, membrana basilari subnulla; opereculo conico longirostro; calyptra angusta dimidiata torta basin capsulæ sæpe amplexante.

CLIMACIUM AMERICANUM, Brid. Bryol. Univ. 2, p. 273; Sulliv. Mosses U. States, p. 66, t. 5.

NECKERA DENDROIDES, var. AMERICANA, C. Müll. Synop. Musc. 2, p. 122.

HAB. Shady woods, on decayed logs, roots of trees, &c.
Common, but seldom in fruit.

This species closely resembles the common European *C. dendroides*, which is a native also of this country. In *C. Americanum* the capsules are cylindrical, narrower, and much longer, with longer-rostrate opercula: the teeth of the peristome are differently shaped, being suddenly subulate from a short lanceolate base (not well represented in the figure): the leaves of the branches are more plicate, and the auricles at their base are much larger; so that a leaf, when flattened, presents a somewhat hastate outline.

TAB. 97. — CLIMACIUM AMERICANUM.

1. Planta capsulifera anormaliter unum alterumve florem masculum ferens, naturali magnitudine.
2. Pars rami.
- 3, 4. Folia ejusdem.
- 5, 6. Areolatio folii baseos et apicis.
7. Cellulæ apicis.
8. Perichætium.
9. Folium ejusdem.
- 10, 11. Capsulæ.
12. Calyptra.
13. Operculum.
14. Particula peristomii.
15. Flos masculus.
16. Folium ejusdem.
17. Antheridium cum paraphysibus.
18. Folium scariosum caulis partis inferioris.

HYPNUM PYGMÆUM, *Schimp.*

Tab. 98.

PLANTÆ minutulæ, depresso- et implexo-cæspitantes, colore viridi in luteo-variegatum vergente.

CAULIS uncialis et ultra, parce divisus, valde papillosus, breviter bipinnato-ramulosus; ramis ramulisque tenuissimis.

FOLIA heteromorpha, caulina multo majora, distantia, late deltoidea, subdecurrentia, longius capillari-acuminata, paten-tissima, ramorum et ramulorum ovato-lanceolata vel elongato-ovata, acutata, erecto-patentia, laxè incumbentia, crassiuscula, opaca, utraque pagina dense papillosa, margine toto papilloso-crenulata; costa valida pellucida infra apicem desinente; rete uniformi e cellulis minutissimis hexagono-rotundis granuloso-chlorophyllosis exstructo; paraphylliis subnullis: perichætialia sublævia, laxius longiusque areolata, interiora vaginantia, elon-gato-lanceolata, tenuiter acuminata, costata, superne leniter serrulata.

FLORES monoici, cauligeni: masculi gemmacei; perigonialibus ecostatis.

CAPSULA altius pedicellata, brevi-oblonga, arcuata, inæqui-lateralis, macrostoma; peristomio hypnoideo, dentibus apice flexuoso-flescentibus, ciliolis ternatis brevibus; annulo perfecto conspicuo; operculo e basi conica subulirostro; calyptra ma-juscula.

THUIDIUM PYGMÆUM, Schimp. Bryol. Europ.

HYPNUM PYGMÆUM (Schimp.), Sulliv. Mosses U. States, p. 67; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 275.

HAB. Grows in thin close mats, on limestone rocks, in shaded ravines, Central Ohio. Rare.

Very near *H. minutulum*: distinguished however by its smaller

size, papillose stems, bipinnate ramification, narrower ramuline leaves, and the absence of paraphyllia.

TAB. 98. — HYPNUM PYGMÆUM.

1. Planta fertilis *naturali magnitudine*.
2. Pars ejusdem.
3. Portio caulis.
4. Ramulus.
- 5, 6, 7, 8. Folia ejusdem.
9. Folium ramuli areolationem monstrans.
10. Sectio transversalis ejusdem.
11. Folium caulinum.
12. Perichætium.
- 13, 14. Folia ejusdem.
15. Apex eorundem areolata.
- 16, 17. Capsulæ cum operculis.
18. Capsula deoperculata.
19. Particula peristomii.
20. Eadem verticaliter secta.
21. Flos masculus.
22. Folium perigoniale.
23. Antheridium.

HYPNUM SCITUM, *Beauv.*

Tab. 99.

PLANTÆ mediocres, depresso-cæspitosæ, colore viridi vel subglaucoviridi in rufo-brunneum vergente insignes.

CAULIS 1–3 uncias longus, firmus, prostratus, bi–tripartitus, simpliciter dense pinnato-ramulosus; ramulis tenuibus.

FOLIA caulina late cordato-triangularia, longius tenui-apiculata; ramulina minora, cordato-ovata, breviter acuminata, laxius incumbens, utraque concava erecto-patentia; costa pellucida ultra medium evanida; reti e cellulis subrotundis minutissimis chlorophyllosis papillois formato; paraphylliis copiosis multiformibus: perichætalia interiora elongato-lanceolata, filiformi-atenuata, longitrorsum plicatulæ.

FLORES monoici in caule vel ejus divisionibus.

CAPSULA oblongo-cylindracea, erectiuscula, leniter curvula, longius pedicellata, leptoderma, speciose annulata, longius rostrato-operculata; peristomio hypnoideo.

HYPNUM SCITUM, Beauv. Prod. p. 69; Brid. Bryol. Univ. 2, p. 575; C. Müll.

Synop. Musc. 2, p. 488; Sulliv. Mosses U. States, p. 67.

THUIDIUM SCITUM, Bryol. Europ.

HAB. Hilly districts, on roots of trees, particularly the Beech.

TAB. 99. — HYPNUM SCITUM.

- | | |
|---------------------------------|--------------------------------------|
| 1. Plantæ naturali magnitudine. | 12. Perichætium. |
| 2. Ramulus. | 13, 14. Folia ejusdem. |
| 3, 4, 5, 6, 7. Folia ejusdem. | 15, 16, 17. Capsulæ. |
| 8. Folium areolatum. | 18, 19. Particulæ peristomii. |
| 9, 10, 11. Paraphyllia. | 20. Flos masc. perigon. et antherid. |

HYPNUM GRACILE, *Br. & Sch.*

Tab. 100.

H. scitum valde referens, distinctum tamen foliis longius acuminatis superne dentato-serratis, capsula e collo brevi turgide ovali oblongave incurvo-cernua fere horizontali macrostoma, præsertim operculo mamillari, etc.

HYPNUM GRACILE, Br. & Sch. in Lond. Jour. Bot. 1843, p. 668; C. Müll.

Synop. 2, p. 488; Sulliv. Musc. Alleghan. No. 5.

THUIDIUM GRACILE, Bryol. Europ.

HAB. Decayed logs in wet woods.

TAB. 100. — HYPNUM GRACILE.

1. Planta *naturali magnitudine*.
2. Pars ramuli.
- 3, 4, 5, 6. Folia ejusdem.
7. Folium rami areolationem monstrans.
8. Idem papillosum.
- 9, 10, 11. Paraphyllia.
12. Perichæetium.
13. Folium ejusdem.
14. Capsula operculo orbata.
15. Capsulæ operculatæ.
16. Particula peristomii.
17. Operculum, cum annuli particula.
18. Calyptra.
19. Flos masculus, perigoniale, antheridium cum paraphysi.

HYPNUM PALUDOSUM, *Sulliv.*

Tab. 101.

PLANTÆ pinnato-ramulosæ, cæspites latos tumescentes laxos e viridi lutescentes efformantes.

CAULIS 3-4-uncialis, "subprostratus, bis terve divisus, divisionibus elongatis simpliciter pinnatis; ramulis haud confertis breviusculis inæqualibus tenuibus laxius subcompresso-foliosis.

FOLIA erecto-patentia, e basi concava cordata lanceolata, parce plicato-striata, margine plus minus reflexa, usque ad summam fere apicem dentatam valido-costata, utraque pagina lævissima, elongate rhomboideo-areolata; paraphylliis ciliato-ramosis copiosis: perichæti polyphylli foliis interioribus oblongis sensim longe tenui-acuminatis longitudinaliter pluries striatis.

FLORES monoici cauligeni: masculi laxe gemmacei; antheridiis paraphysatis.

CAPSULA oblongo-cylindracea, incurvo-cernua, annulata; peristomii ciliis in carina parce rimulosis, ciliolis ternatis nodoso-articulatis dentes lineali-lanceolatos æquantibus; operculo brevissimo conico-apiculato.

HYPNUM PALUDOSUM, *Sulliv. Musc. Alleghan. No. 7*; *Mosses U. States, p. 68*; *Müll. Synop. Musc. 2, p. 455*; *Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 281.*

HAB. Cranberry marshes, Northern Ohio. Rhode Island, *Olney*. Massachusetts, *Russell*. Vermont, *Frost*.

Resembles *H. Blandovii*, with which it is not unfrequently confounded: but that species is a *Thuidium*, *Bryol. Europ.*, and has upright or ascending stems, more densely clothed with longer and more compound paraphyllia: its leaves are more

crowded, not so long acuminate, strongly papillose on the lower surface, and fringed at their basal margins with long branched threads.

TAB. 101. — *HYPNUM PALUDOSUM*.

1. *Planta naturali magnitudine.*
2. *Pars ramuli.*
- 3, 4, 5. *Folia.*
6. *Areolatio folii baseos.*
7. *Eadem apicis.*
- 8, 9. *Sectiones transversales folii.*
10. *Paraphyllum.*
11. *Perichætium.*
12. *Folium ejusdem.*
- 13, 14, 15. *Capsulæ.*
16. *Particula peristomii.*
17. *Eadem annuli.*
18. *Operculum.*
19. *Calyptra.*
20. *Flos masculus.*
21. *Perigoniale, antheridium, et paraphysis.*

HYPNUM OAKESII, *Sulliv.*

Tab. 102.

PLANTÆ majores, in cæspitibus depresso-tumescensibus late longeque extensis e viridi lutescentibus degentes.

CAULIS 3–4-uncialis, innovationibus arcuatis annuatim repetitis continuans, remote irregulariter subpinnato-ramulosus; ramis et ramulis compressiuscule foliosis.

FOLIA caulina late ovata, patentia, haud conferta; ramea ramulinaque nitida, laxè incumbens, erecto-patentia, subelliptico-oblonga, plus minus distincte complanata; omnia concava, brevius longiusve acuminata, margine usque ad apicem fere recurva, superne irregulariter grosse serrata, ad medium tenui-costata, minute lineari-hexagono-areolata, plus minusve sulcato-striata; paraphylliis numerosis ramosissimis: perichætialia ecostata, ad medium erecto-vaginantia, dehinc squarroso-reflexa, longe attenuata, argute serrata.

FLORES dioici: femineis cauligenis haud numerosis; masculis ad ramorum basin; antheridiis copiose paraphysatis.

CAPSULA in pedicello longo tenui superne arcuato turgide gibboso-ovata, pachyderma, deorsum spectans, vix annulata; peristomii dentibus basi confluentibus e lineali subulatis dense articulatis, ciliis in carina hic illic hiantibus, ciliolis 2–4 longis; operculo convexo-conico cum rostro brevi.

HYPNUM OAKESII, *Sulliv.* in *Gray, Man. Bot.* p. 673 (1848), & *Mem. Amer. Acad. n. ser.* 4, p. 173, t. 5; *C. Müll. Synop.* 2, p. 461.

HYPNUM FIMBRIATUM, *Hartm.* *Scand. Flora* (1849); *C. Müll. Synop.* 2, p. 461.

HYPNUM PYRENAICUM, *Spruce* in *Ann. Nat. Hist.* 3, p. 129, t. 1 (1849); *C. Müll. Synop.* 2, p. 456.

HYLOCOMIUM FIMBRIATUM, *Bryol. Europ.* t. 489.

HYLOCOMIUM OAKESII, *Schimp.* *Synop. Musc. Europ.* p. 654.

HAB. White Mountains of New Hampshire, *Oakes, James.*

Black Mountain, South Carolina, and the Adirondack Mountains, New York, *Lesquereux*. Not uncommon in Europe, but seldom in fruit.

Hypnum brevirostre, *Ehrh.*, to which this species is closely related, is a coarser and more rigid plant, with an irregular fasciculate ramification and longer terete flexuous branchlets: the leaves are cordate-ovate, acuminate, more crowded and spreading, slightly serrulate above, and furnished at the base with two short costæ: the paraphyllia are larger, and their divisions more compound.

TAB. 102. — *HYPNUM OAKESII*.

- 1, 2. Plantæ femineæ et masculæ *naturali magnitudine*.
3. Pars ramuli.
- 4, 5. Folia ejusdem.
- 6, 7. Rete basilare et apicale folii.
- 8, 9, 10. Sectiones transversales folii.
11. Paraphyllia.
12. Perichætium.
13. Folium ejusdem.
14. Capsulæ.
15. Particula peristomii.
16. Flos masculus.
- 17, 18. Folia perigonia.
19. Antheridium cum paraphysi.

HYPNUM ALLEGHANIENSE, C. Müll.

Tab. 103.

PLANTÆ arbusculæformes, majusculæ, cæspites laxos rigidos elasticos formantes, colore saturate viridi insignes.

CAULIS secundarius bi-triuncialis e caule prostrato rhizomatoideo ortus, inferne erectus, simplex, firmus, nudus vel foliolis scariosis appressis instructus, rufo-brunneus nitens, superne conferte pinnato- vel subfasciculato-ramulosus, arbusculam imitans.

FOLIA caulis superioris et ramulorum densius et subcomplanate disposita, erecto-patentia, ovato- vel elliptico-oblonga, apice lata breviter acuta, grosse serrata, concava, incurviuscula, basi constricta subamplexantia; costa dorso superne dentata infra apicem finiente; retis cellulis superioribus ovali-ellipticis granuloso-chlorophyllosis, inferioribus oblongis inanibus: perichætalia erecta, tenui-acuminata, ecostata.

FLORES synoici et monoici, cauligeni et ad ramorum basin siti, copiose paraphysati; antheridiis longe pedicellatis.

CAPSULA ovali-oblonga vel oblonga, æqualis vel inæqualis, in pedicellum 5-8-linearem curvato-inclinatum ramos vix supereminentem sensim defluens, horizontalis, macrostoma, haud plagiostoma, anguste annulata; peristomio hypnoideo, ciliis carina plus minus fissis, ciliolis longis ternatis appendiculato-articulatis; operculo convexo-conico oblique rostrato; calyptra parva dimidiata fugaci.

HYPNUM ALLEGHANIENSE, C. Müll. Synop. 2, p. 502; Sulliv. Mosses U.

States, p. 69; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 288.

HYPNUM NECKEROIDES, Hook. ex Hook. & Wils. in Drumm. Musc. Amer.

Coll. 2, No. 119.

THAMNIUM ALLEGHANIENSE, Bryol. Europ.

HAB. On rocky and shady banks, in mountainous districts.

Hypnum neckeroides, Hook. (Musc. Exot. t. 58), from our Northwest Coast, appears according to the figure and description to be very like the plant under notice ; its inflorescence, however, is said to be dioicous.

TAB. 103. — HYPNUM ALLEGHANIENSE.

1. Plantæ naturali magnitudine.
2. Pars ramuli.
3. 4, 5. Folia ejusdem.
6. 7. Areolatio basilaris et apicalis folii.
8. Sectiones transversales folii.
9. Capsulæ operculatæ.
10. Particula peristomii.
11. Eadem verticaliter secta.
12. Calyptra.
13. Perichætium.
- 14, 15. Folia ejusdem.
16. Folium ejusdem, cum antheridiis archegoniis et paraphysibus.
17. Antheridia, archegonia, et paraphyses.

HYPNUM HIANS, *Hedw.*

Tab. 104.

PLANTÆ laxæ depresso-cæspitantes, læte viridi-lutescentes, nitidi.

CAULIS 3–7-uncialis, pallidus, flexilis, parce divisus, prorepens, fasciculato-radiculosus, irregulariter distiche ramulosus; ramulis subsimplicibus.

FOLIA laxius complanato-disposita, lateralia valde patentia, cordato-ovata, longius breviusve acuta, superne serrulata, marginibus plus minus recurvis; costa tenui supra medium abrupte desinente; reticulo e cellulis elongato-hexagonis exstructo: perichætialia longe tenui-acuminata, apice argute serrata recurvo-squarrosa, interna subecostata.

FLORES dioici, cauligeni; gemmis masculis oblongo-ovatis; antheridiis paraphysatis.

CAPSULA ovalis et oblonga, cernua, subincurva, annulata; pedicello 6–8-lineari rubello muriculato; vaginula paraphysibus longis e perichætio exsertis hirta; peristomii dentibus lanceolato-subulatis dense articulatis intus prominenter lamellosis, ciliis in carina rima longa hiantibus, ciliolis binis; operculo e basi convexo-conico longe subulirostro, rostro recto sursum vel deorsum spectante; calyptra angusta dimidiata fugaci.

HYPNUM HIANS, Hedw. Sp. Musc. p. 272, t. 70; Brid. Bryol. Univ. 2, p. 456;

Sulliv. Musc. Alleghan. No. 53; Mosses U. States, p. 69.

HYPNUM PRÆLONGUM, Linn. ex Müll. Synop. Musc. 2, 447.

PTERIGYNANDRUM APICULATUM, Brid. Bryol. Univ. 2, p. 195, ex Müll. l. c.

HAB. Moist shady banks, hillsides, in woods, &c., common.

H. hians, *Hedw.*, scarcely affords characters sufficiently decided to separate it from *H. prælongum*, *Linn.*, a moss subject to

many deviations from its typical form, dependent on local influences.

TAB. 104. — HYPNUM HIANs.

- 1, 2. Plantæ femineæ et masculæ *naturali magnitudine*.
3. Ramulus.
- 4, 5, 6. Folia ejusdem.
- 7, 8. Areolatio folii.
- 9, 10. Sectiones transversales folii.
11. Perichætium.
12. Folium ejusdem.
- 13, 14. Capsulæ operculatæ.
15. Capsula cum operculo delapso ac pedicelli muriculati particula.
16. Pars peristomii.
17. Calyptra.
18. Flos masculus.
19. Folium ejusdem.
20. Antheridium cum paraphysi.



HYPNUM SULLIVANTII, *Spruce.*

Tab. 105.

PLANTÆ minores, nunc ascendentes, densius cæspitantes, fastigiato-ramosæ, nunc laxè demisso-intricatæ, pallide virides absque nitore, inferne sordide flavescentes.

CAULIS subuncialis, tenuis, rigidiusculus, divisus, vage et subfastigiatim ramulosus; ramulis rectis 3–7-linearibus.

FOLIA erecta, laxius incumbentia, ovato-lanceolata et lineari-lanceolata, longe tenui-acuminata, basi concava, ibidemque margine recurva, toto ambitu serrulata, dorso hic illic papillis conspersa; costa supra medium evanescente; areolatione minuta e cellulis flexuoso-linealibus obtusis, illis ad angulos insertionemque decurrentem subquadratis: perichætialia e basi oblonga vaginante filiformi-attenuata varieque flexa, subecostata.

FLORES dioici: perigonalibus subito longius acuminatis; antheridiis paraphysatis.

CAPSULA ovalis, oblonga, turgide gibboso-ovata, cernua; pedicello 4–7 lineas longo ubique tuberculato; annulo subpersistente; peristomii dentibus lanceolato-subulatis firmis crebre articulatis aurantiacis, cuticula dorsali transversim striolata, ciliis luteolis dentes æquantibus in carina dehiscentibus, ciliolis binis; operculo breviusculo conico plus minus acuminato.

HYPNUM SULLIVANTII, Spruce in Gray, Man. Bot. 1848; Müll. Synop. Musc. 2, p. 430; Sulliv. Mosses U. States, p. 69; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 291.

HYPNUM PRÆLONGUM, var., Sulliv. Musc. Alleghan. No. 44.

HAB. On the ground, margins of woodland brooks, &c.

This species is intermediate between *H. prælongum*, *L.*, and the Californian *H. Whippleanum*, *Sulliv.*; differing from the first in its much shorter operculum, and slenderly acuminate leaves

sparsely papillose on the lower surface. In *H. Whippleanum* the exannulate capsule is abruptly horizontal, the rostrum of the operculum is shorter, the roughness of the pedicel is variable, and the leaves are of a thicker texture, differently areolated, strongly papillose, and with a pellucid costa reaching nearly to the apex.

TAB. 105. — *HYPNUM SULLIVANTII*.

- 1, 2. Plantæ femineæ et masculæ *naturali magnitudine*.
3. Ramulus.
- 4, 5, 6, 7, 8. Folia.
- 9, 10. Areolatio folii baseos et apicis.
- 11, 12. Sectiones transversales ejusdem.
13. Perichæetium.
14. Folium ejusdem.
- 15, 16. Capsulæ.
17. Particula peristomii.
18. Eadem verticaliter secta.
19. Operculum cum columella.
20. Organa mascula.

HYPNUM BOSCHII, *Schwægr.*

Tab. 106.

PLANTÆ robustiores, molles, e viridi aureo-fuscescentes, cæspites demissos laxos formantes.

CAULIS prostratus, 2–4 uncias longus, vetustior fragilis subdefoliatus, parce divisus, fasciculato- vel subpinnato-ramulosus; ramulis elongatis subsimplicibus inæqualibus obtusis turgide tereti-foliosis.

FOLIA arcte imbricata, e basi cordata amplexante oblongo-ovata, repente filiformi-apiculata, cochleariformi-concava, scariosa, nitida, breviter bicostata, vel costa unica tenui ultramedia instructa, marginibus erectis toto ambitu serrulata, exilissime lineari-areolata; cellulis basilaribus brevioribus incrassatis fuscoluteis: perichætialia longe tenui-acuminata, inferiora squarrosa, superiora erecta.

FLORES dioici; feminei paraphysibus filiformibus copiosis mixti; masculi ignoti.

CAPSULA oblonga, erecto-incurva, annulata; pedicello subunciali lævi; peristomii dentibus lanceolato-subulatis dense articulatis, ciliis carina pertusis, ciliolis ternis; operculo conico brevius rostrato.

HYPNUM BOSCHII, Schwægr. Suppl. 1, 2, p. 223; Brid. Bryol. Univ. 2, p. 430; Müll. Synop. 2, p. 395; Sulliv. Mosses U. States, p. 70; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 294.

HYPNUM ILLECEBRUM, Hedw. Sp. Musc. t. 66, f. 1, 2, p. 252.

HYPNUM cupressiforme rotundius, vel Illicebræ æmulum, Dill. Hist. Musc. p. 311, t. 49, f. 46.

HAB. On the ground, in hilly and wooded districts: not uncommon, but rarely in fruit.

Hypnum Boschii in general appearance, and in shape, texture, areolation, and position of the leaves, very much resembles those

large forms of *Hypnum illicebrum*, Linn. which occur in the southern portions of Europe ; but that species is at once distinguished by its somewhat smaller size, its shorter-rostrate operculum, and its strongly papillose pedicel.

Hypnum purum is not unlike the moss under notice, but is readily separated by (besides other and less striking characters) its more pinnate ramification and shorter flexuose and more slender branchlets.

TAB. 106. — HYPNUM BOSCH.

- 1, 2. Plantæ naturali magnitudine.
3. Pars ramuli.
- 4, 5, 6. Folia ejusdem.
- 7, 8. Rete folii baseos et apicis.
9. Perichætium cum pedicelli basi.
- 10, 11. Folia perichætialia.
12. Capsulæ operculatæ.
13. Capsula absque operculo.
14. Pars peristomii cum annuli particula.
15. Calyptra.

HYPNUM SERRULATUM, *Hedw.*

Tab. 107.

PLANTÆ læte vel pallide virides, nitidæ, stratum tenue laxum diffusum efficientes.

CAULIS arcte repens, elongatus, bis terve divisus, distanter distiche ramulosus; divisionibus ramulisque prostratis laxissime bifariam foliosis.

FOLIA tenuia, complanata, patentissima, ovato-lanceolata, anguste acuminata, superne serrulata, laxius elongato-rhomboideo-areolata, ad medium costa debili instructa: perichætialia oblonga, scariosa, albescentia, laxè amplexantia, subito filiformi-attenuata, apice varie flexa, ecostata (nec costata ut icon nostra false effingit).

FLORES monoici, copiose et exserte paraphysati; masculis gemmiformibus.

CAPSULA oblonga, cernuo-incurva; pedicello erecto-flexuoso lævi; peristomii dentibus lineali-lanceolatis firmis dense articulatis hyalino-marginatis, ciliis integris dentibus æquilongis, ciliolis 2-3 brevioribus nodoso-articulatis; annulo specioso facile discedente; operculo e basi conica longe rostrato.

HYPNUM SERRULATUM, Hedw. Sp. Musc. t. 60, p. 238; Brid. Bryol. Univ. 2, p. 390; Sulliv. Mosses U. States, p. 70.

HAB. On the ground in dry woods, forming loose thin strata, usually over decayed leaves.

H. serrulatum is very closely allied to *H. confertum*, *Dicks.*, and it is questionable if essential characters separating them exist.

TAB. 107. — HYPNUM SERRULATUM.

1. Planta fertilis *naturali magnitudine*.
2. Ramulus ejusdem.
3. 4. Areolatio basilaris et apicalis folii.
5. Cellulæ apicales ejusdem.
6. Capsula cum opercula et calyptra.
7. Eadem operculo delapso.
8. Eadem operculata.
9. Pars peristomii cum annuli particula.
10. Pars annuli.
11. Operculum cum annuli portione adhærente.
12. Perichætium basi radiculosum.
13. Ejusdem folium (false costatum).
14. Flos masculus.
15. Perigoniale et antheridium cum paraphysi.

HYPNUM DEPLANATUM, *Schimp.*

Tab. 108.

PLANTÆ fertiles parviusculæ, infertiles majores, cæspites demisso-planos condensatos nitentes læte virides in apricis brunneo-aurescentes edificantes.

CAULIS 1–2 uncias longus, divisus, irregulariter vel subpinnato-ramulosus; ramulis brevibus eodem modo ac caulis divisiones tota longitudine radiculis copiosis substrato arcissime adhærentibus bifariam foliosis.

FOLIA conferte deplanato-imbricata, ovato-lanceolata, sensim longius acuminata, modice concava, tenuia, e cellulis minutissimis flexuosis lineari-fusiformibus texta, a basi ad apicem serrulata; costa brevissima vel obsoleta: perichætii oligophylli folia aperto-erecta, superiora tenui-acuminata, superne grosse dentata.

FLORES dioici? femineis cauligenis; masculis nondum prehensis.

CAPSULA ovali-oblonga, subæqualis, cernua, in pedicello 5–8-lineari rubello lævi sensim continua, sicca arcuata plicatula sub ore ampliato constricta turbinata; annulo omnino nullo; peristomii dentibus lanceolato-subulatis dense articulatis intus lamelligeris, ciliis dentes æquantibus in carina integris, ciliolis binis brevioribus; operculo longius breviusve rostrato.

HYPNUM DEPLANATUM, Schimp. in litt.; Sulliv. Musc. Alleghan. No. 50; Mosses U. States, p. 70; Müll. Synop. 2, p. 260; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 296.

HAB. Dry woods, in close thin mats, near the ground on stones and roots of trees: not uncommon, but usually without fruit.

Not unlike the smaller and condensed forms of *Hypnum serrulatum*; but in that species the longer-pointed leaves are more

loosely areolated, the perichæatial leaves are squarrose, the operculum is longer-rostrate, an annulus is present, and the inflorescence is monoicous.

TAB. 108. — *HYPNUM DEPLANATUM*.

- 1, 2. *Plantæ naturali magnitudine.*
3. *Ramulus.*
- 4, 5, 6, 7. *Folia ejusdem.*
- 8, 9. *Folii areolatio basilaris et apicalis.*
10. *Perichætium cum pedicelli parte.*
11. *Folium ejusdem.*
12. *Capsula operculata cum calyptra.*
- 13, 14. *Capsulæ deoperculatæ.*
15. *Capsula evacuata sicca.*
16. *Particula peristomii.*
17. *Sectio verticalis ejusdem.*
- 18, 19. *Opercula.*
20. *Calyptra.*

HYPNUM CYLINDRICARPUM, *C. Müll*

Tab. 109.

PLANTÆ in cæspitibus intricato-implexis demissis extensis e viridi fusco-aureis subnitidis degentes.

CAULIS gracilis, repens, divisus, densius pinnato-ramulosus; ramulis tenuibus 3-6-linearibus compresse foliosis.

FOLIA bifariam laxè incumbentia, plus minus deorsum falcato-secunda, anguste oblongo-lanceolata, longe tenuiter acuminata, concava, apice argute serrata, margine præsertim inferiore recurva; costa gemella perbrevis vel subnulla; reti lineari, cellulis ad basis angulos amplis subquadratis vesiculosis; perichætialia laxè imbricata, erecta; interiora oblonga, filiformi-attenuata; superne grosse serrata, ecostata.

FLORES dioici, paraphysati: plantæ masculæ femineis mixtæ; perigoniis basi radicantibus.

CAPSULA cylindraceo-oblonga, æqualis, recta et erecta, quandoque subinæqualis erecto-incurvula; pedicello tenui longiusculo; peristomii lutescentis dentibus lineali-subulatis crebre articulatis hyalino-marginatis, ciliis dentes æquantibus carina rimulosis, membrana basilari angusta, ciliolis rudimentariis vix ullis; operculo conico oblique longius subulirostro; calyptra dimidiata angusta ad operculi basin porrecta.

HYPNUM CYLINDRICARPUM, *C. Müll.* Synop. Musc. 2, p. 308 (1851); Sulliv. Mosses U. States, p. 71; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 300.

LESKEA POLYANTHA, var., Sulliv. Musc. Alleghan. No. 60.

LESKEA TENUIROSTRIS, Schimp. in litt. (1848); Sulliv. in Gray, Man. Bot. ed. 1, p. 668.

HAB. On decayed logs in woods, New Jersey to Ohio, and southward along the Alleghany Mountains to Georgia.

Distinguished from *Pylaisæa polyantha* (slender forms of which it resembles) by its cylindrical capsule, longer-rostrate operculum, basal leaf-cells, and dioicous inflorescence.

TAB. 109. — *HYPNUM CYLINDRICARPUM*.

- 1, 2. Plantæ femineæ et masculæ *naturali magnitudine*.
3. Pars ramuli.
- 4, 5, 6, 7, 8. Folia ejusdem.
- 9, 10. Areolatio folii baseos et apicis.
11. Perichætium basi radicans.
- 12, 13. Folia ejusdem.
14. Capsulæ operculatæ.
15. Capsula absque operculo.
16. Calyptra operculum includens.
17. Operculum.
18. Particula peristomii.
19. Apex peristomialis dentis.
20. Flos masculus, perigoniale, et antheridium paraphysibus stipatum.

HYPNUM MICROCARPUM, C. Müll.

Tab. 110.

PLANTÆ tenellæ, intricato-cæspitosæ, nitidæ, colore e viridi aurescente insignes.

CAULIS prostratus, substrato arcte adhærens; ramulis brevibus recurvo- vel incurvo-erectis.

FOLIA conferta, plus minus homomalla, anguste oblongo-lanceolata, tenui-acuminata, profundius concava, margine reflexa, apice obsolete serrulata, ecostata vel striis costæformibus brevissimis notatis; cellulis retis laxiusculi lineari-fusiformibus, angulorum multo majoribus, superioribus quadratis, inferioribus 3-5 utrinque oblongis inflatis pro more aureis: folia perichætii radicantis laxa, oblongo-acuminata.

FLORES monoici in caule ramulisque, haud vel parcissime paraphysati.

CAPSULA minuta, æqualis, ovalis vel elongato-ovalis, in pedicello 4-5-lineari erecta, brevicolla, leptoderma, exannulata, sicca sub ore rubello leniter constricta; peristomii flavescentis dentibus e lineari-lanceolato subulatis linea divisurali flexuosa præditis densius articulatis intus maxime prominenter lamellosis, ciliis dentibus æquilongis latis integris, ciliolis singulis brevibus; operculo e basi depresso-conica oblique longissime subulirostro; calyptra dimidiata paulo infra operculi basin descendente.

HYPNUM MICROCARPUM, C. Müll. Synop. 2, p. 326; Sulliv. Mosses U. States, p. 71.

HYPNUM CRASSIUSCULUM, Schwægr. ex Hook. & Wils. in Drumm. Musc. Amer. Coll. 2, No. 107.

LESKEA ADNATA, Michx. Fl. Bor.-Amer. 2, p. 314; Brid. Bryol. Univ. 2, p. 289; Sulliv. Musc. Alleghan. No. 65, 66.

VAR. ANISOCARPON; capsula subhorizontali inæquali breviter oblonga vel lenissime obovata incurvula, basi longius sensim an-

gustata, siccitate sub ore valde strangulata turbinata: forsan species propria.

HYPNUM ADMISTUM, Sulliv. Musc. Cubens. Wright. in Proceed. Amer. Acad. 5, p. 289 (1861).

HAB. On trees, Southern States: very common. Cedar Swamps, Central Ohio. The var. *anisocarpon*: Island of Cuba, *Wright*. New Jersey, *Austin*.

A widely dispersed species. According to Wilson (in Hook. f. Fl. N. Zeal.) it is a native of New Zealand, the West Indies, South America, and the island of Tristan d'Acunha: found also in the Sandwich Islands by the United States Exploring Expedition under Commodore Wilkes.

TAB. 110. — HYPNUM MICROCARPUM.

1. Plantæ naturali magnitudine.
2. Pars ramuli.
- 3, 4, 5, 6. Folia ejusdem.
- 7, 8. Areolatio folii baseos et apicis.
- 9, 10. Sectiones transversales folii.
11. Perichætium radiculis instructum.
12. Folium ejusdem.
13. Capsula operculata et calyptrata.
14. Eadem operculata absque calyptra.
15. Eadem operculo et calyptra delapsis.
16. Particula peristomii.
17. Eadem verticaliter secta.
18. Operculum et calyptra.
19. Flos masculus, antheridium, et perigoniale.

HYPNUM RECURVANS, *Schwægr.*

Tab. 111.

PLANTÆ mediocres, fertilissimæ, nitidulæ, in cæspitibus late
extensis depressis pallide viridibus ætate dilute ochraceis de-
gentes.

CAULIS prostratus, repens, 1-3-uncialis, firmus, rubellus,
distincte translucens, pinnato-ramulosus; ramulis subcompla-
nato-foliatis.

FOLIA conferta, deorsum imbricato-secunda, tenuia, mollia,
pallida, concava, ovato-lanceolata, longius piliformi-acuminata,
apice serrata, margine anguste recurva; costa gemella fere obso-
leta; reti maxime angusto vermiculiformi, cellulis angularibus
aureo-lutescentibus subquadratis majusculis inflatis: folia peri-
chætii radicans longius sensimque attenuata, suberecta, summo
apice solo argute serrata.

FLORES dioici, paraphysati, cauligeni; masculis gemmifor-
mibus.

CAPSULA breviuscula, turgida, oblonga, inclinata, leniter in-
curva, pachyderma, exannulata; pedicello 7-10-lineari flexuoso-
erecto; peristomii dentibus lanceolato-subulatis dense articulatis
ad latera hyalinis, ciliis dentibus æquilongis latis carinatis inte-
gris, ciliolis binis interpositis; operculo e basi convexo-conica
brevius longiusve rostrato.

HYPNUM RECURVANS, Schwægr. Suppl. t. 146; Brid. Bryol. Univ. 2, p. 614;
Sulliv. Mosses U. States, p. 71.

LESKEA RECURVANS, Michx. Fl. Bor.-Amer. 2, p. 311.

LESKEA SQUARROSA, Michx. op. cit. p. 312.

HAB. On trees and decayed logs, in mountainous districts;
very common.

Resembles small forms of *H. cupressiforme*, *L.*; but is separated by its dioicous inflorescence, the absence of an annulus, &c.

TAB. 111. — *HYPNUM RECURVANS.*

- 1, 2. Plantæ femineæ et masculæ *naturali magnitudine.*
3. Portio ramuli.
- 4, 5, 6. Folia ejusdem.
- 7, 8. Areolatio folii baseos et apicis.
9. Perichætium basi radicans.
10. Folium ejusdem.
- 11, 12. Capsulæ operculatæ.
13. Capsula absque opereulo.
14. Particula peristomii.
15. Calyptra.
16. Operculum.
17. Flos masculus.
18. Folium perigoniale.
19. Antheridium cum paraphysi.

HYPNUM ALBULUM, C. Müll.

Tab. 112.

PLANTÆ tenellæ, delicatulæ, laxissime cæspitulosæ, e dilute viridi albescentes.

CAULIS prostratus, arcte radicans, pallidus, vage ramosus; ramis inordinate pauci-ramulosis.

FOLIA laxa, complanata, lateralia patentissima, tenuia, pallida, flaccida, ovato-lanceolata, longius anguste acuminata, haud raro deorsum subfalcata, superne obsolete serrulata, breviter gemello-costata, exilissime lineari-areolata; cellulis angularibus paucis subquadratis: perichætialia interiora erecta, oblonga, subito longe acuminata, ad acuminis basin grossius dentata.

FLORES monoici, cladogeni; antheridiis vix paraphysatis.

CAPSULA minuta, ovalis oblonge ovalisve, æqualis inclinata, vel inæqualis leniter incurva, exannulata; pedicello 5-6-lineari debili; peristomii dentibus luteis lanceolato-linearibus firmis densius articulatis, ciliis dentium longitudine angustis in carina inter articulationes rimulosi, ciliolis brevibus nodosis binatis; operculo conico brevissime acuminato.

HYPNUM ALBULUM, C. Müll. Synop. Musc. 2, p. 280; Sulliv. Mosses U. States, p. 71; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 302, 302^b.

HYPNUM TENERUM, Hook. & Wils. in Drumm. Musc. Amer. Coll. 2, No. 108, 109.

HYPNUM SUBSIMPLEX, Hook. & Wils. in Lond. Jour. Bot. p. 162 (1844); Sulliv. Musc. Alleghan. No. 52.

HAB. On the ground and much decayed wood, in moist places.

Distinguished from small forms of *Hypnum recurvans* by its lax mode of growth, more delicate habit, shorter-rostrate opercu-

lum, different perichæatial leaves, and the absence of large inflated yellow cells at the basal angles of the leaf.

TAB. 112. — HYPNUM ALBULUM.

1. *Planta naturali magnitudine.*
2. *Pars ramuli.*
- 3, 4, 5, 6. *Folia ejusdem.*
7. *Areolatio folii baseos.*
8. *Eadem apicis.*
9. *Cellulæ ejusdem.*
10. *Perichætium radiculis instructum.*
- 11, 12, 13. *Folia ejusdem.*
14. *Capsulæ operculatæ.*
15. *Capsulæ absque operculis.*
16. *Particula peristomii.*
17. *Flos masculus.*
18. *Folium perigoniale.*
19. *Antheridium.*

HYPNUM MONTANUM, *Wils.*

Tab. 113.

PLANTÆ tenellæ, in cæspitibus late extensis tumescentibus mol-
libus inferne rufo-fuscis superne lutescenti-viridibus nitidulis de-
gentes.

CAULIS tenuis, prostratus, 1–2 uncias longus, parte anno-
siore denudatus; ramis gracilibus erectis simplicibus quandoque
fastigiato-ramulosis.

FOLIA vario modo flexa, sæpius subfalcato-secunda, concava
vel complicato-concava, late ovato-lanceolata, longius acuminata,
decurrentia, toto ambitu leniter serrulata, marginibus erectis
vel reflexis; costa perbrevis gemella vel subnulla; reti angusto
elongato-fusiformi, angulari ampliore oblongo: perichætalia in-
teriora erecta, elongato-oblonga, tenui-acuminata, pluries sulcato-
striata.

FLORES monoici, paraphysati, in caule primario siti; masculis
gemmiformibus.

CAPSULA oblonga, erecto-cernua, late annulata; pedicello tenui
cygnocollo 6–8-lineari et ultra; peristomii dentibus lanceolato-
subulatis pallide luteolis intus prominenter lamelligeris, ciliis
integris, ciliolis binis ternisve nodosis; operculo breviter con-
vexo-conico.

HYPNUM MONTANUM, *Wils.*, ex James Enum. in Proceed. Acad. Nat. Sci.
Philad. (1855); Sulliv. Mosses U. States, p. 72; Sulliv. & Lesqx. Musc.
Bor.-Amer. Exsicc. (ed. 1), No. 306.

HAB. On moist rocky banks of rivulets, White Mountains
of New Hampshire, *Oakes, James.*

Very near the variable *H. palustre*; separated only by its smaller size and large annulus.

TAB. 113. — *HYPNUM MONTANUM*.

1. Plantæ *naturali magnitudine*.
2. Ramus.
- 3, 4, 5, 6. Folia ejusdem.
7. Rete folii baseos.
- 8, 9. Idem apicis.
10. Perichæetium cum pedicelli parte.
- 11, 12. Folia ejusdem.
- 13, 14. Capsulæ.
15. Particula peristomii.
16. Eadem verticaliter secta.
17. Opercula.
18. Flos masculus in folii axilla.
19. Folium perigoniale.
20. Antheridium cum paraphysi.

HYPNUM CURVIFOLIUM, *Hedw.*

Tab. 114.

PLANTÆ majores, late intricato-cæspitosæ, e viridi aurescentes, nitidæ.

CAULIS prostratus, 3-4-uncialis, divisus, distiche ramulosus; ramulis approximatis brevibus inæqualibus subcompressofoliosis.

FOLIA conferta, bifariam imbricata, deorsum falcato-secunda, e basi^a auriculato-cordata longe sensim acuminata, concava, superne lenissime serrulata, ecostata vel brevissime bicostata, angustissime pallide lineari-flexuoso-areolata; cellulis basilariibus et angularibus brevioribus latioribus aureis: folia perichætii conspicui albescens numerosa, erecta, arcte vaginantia, laxius texta, longitudinaliter pluries sulcato-striata.

FLORES dioici, cauligeni, paraphysati: plantæ masculæ fertilibus mixtæ.

CAPSULA alte pedicellata, majuscula, oblonga, turgida, incurvobernua, tenui-membranacea, in sicco arcuata et valde costata; annulo triseriato revolubili; peristomii dentibus lanceolato-subulatis luteolis crebre articulatis intus apicem versus late lamellosis, ciliis in carina pertusis, ciliolis binis ternisve appendiculatis; operculo conico acuto.

HYPNUM CURVIFOLIUM, Hedw. Sp. Musc. p. 285, t. 75; Brid. Bryol. Univ. 2, p. 613; Müll. Synop. Musc. 2, p. 292, ex parte; Sulliv. Mosses U. States, p. 74.

HAB. Grows in large mats on decayed logs, in shady woods.

Not unlike large forms of *Hypnum cupressiforme*; but distin-

guished by its large white striated perichæatial leaves, and by its capsule being prominently costate when dry.

TAB. 114. — HYPNUM CURVIFOLIUM.

- 1, 2. Plantæ femineæ et mascule *naturali magnitudine*.
3. Pars ramuli.
- 4, 5, 6, 7. Folia ejusdem.
8. Areolatio folii baseos.
9. Eadem apicis.
10. Perichætium.
- 11, 12. Folia ejusdem.
13. Capsula operculata.
14. Capsula sicca absque operculo.
15. Particula peristomii.
16. Sectio verticalis ejusdem.
17. Calyptra.
18. Flos masculus, perigoniale, et antheridium cum paraphysi.

HYPNUM LÆTUM, *Brid.*

Tab. 115.

PLANTÆ laxè intricato-cæspitosæ; cæspitibus extensis leniter tumescentibus e viridi lutescentibus sericeo-nitidis.

CAULIS prostratus, divisus; ramis ramulisque plus minus approximatim inæqualibus erectis subsciuroideis apice attenuatis.

FOLIA conferta, undique erecto-patentia, e basi ovata concava marginibus late recurva lanceolata, in acumen rectum brevius longiusve sensim angustata, plus minus striata, toto fere ambitu leniter serrulata; costa ultra medium procedente; reti tenui elliptico-lineari, cellulis ad angulos basilares subquadrates numerosis granulosis: perichætialia numerosa, membranacea, mollia, intima laxè vaginantia oblonga ex apice abrupto filiformi-acuminata, acumine varie flexo.

FLORES dioici: feminei plerumque cauligeni; masculis supra ramulorum basin sitis; paraphysibus in utroque flore copiosis.

CAPSULA in pedicello subunciali purpureo lævi oblongo-cylindracea, curvula, leniter inclinata, vel brevior turgida erecto-cernua, pachyderma, exannulata, badia; operculo elongato-conico vel conico brevi-rostrato; peristomii dentibus lanceolato-subulatis luteis densius articulatis, ciliis rimulosis punctatis, ciliolis binis nodosis.

HYPNUM LÆTUM, *Brid. Bryol. Univ.* 2, p. 479; *Müll. Synop. Musc.* 2, p. 357; *Sulliv. Mosses U. States*, p. 75.

HYPNUM LUTEOLUM, *Müll. Synop. Musc.* 2, p. 357.

HYPNUM SALEBROSUM, *Sulliv. Musc. Alleghan.* No. 43.

BRACHYTHECIUM LÆTUM, *Bryol. Europ.* t. 554; *Schimp. Synop. Musc. Europ.* p. 531.

HAB. On decayed logs and the ground, in moist shaded places; common.

Subject to considerable variation in size, habit, acumination of leaf, &c. Not easily distinguished from *Hypnum salebrosum*, *Hoffm.*, except by its dioicous inflorescence and usually more slender suberect and less curved capsule.

The foregoing description and the drawings for Plate 115 are from specimens labelled "H. 20. Coll. Dewey." in the Herbarium of Dr. Torrey. Bridel (*Bryol. Univ. l. c.*) refers to North American specimens from Torrey thus labelled as the materials on which he established his *Hypnum latum*; hence there can be little question that the specimens first mentioned are also authentic for the true *Hypnum latum*, *Brid.*, a species about which some doubts have heretofore prevailed.

TAB. 115. — *HYPNUM LATUM*.

- 1, 2. Plantæ femineæ et masculæ *naturali magnitudine*.
3. Pars ramuli.
- 4, 5, 6. Folia ejusdem.
- 7, 8, 9, 10. Portiones folii areolationem exhibentes.
11. Sectiones transversales folii.
12. Perichætium cum pedicelli basi.
- 13, 14. Folia perichætialia.
- 15, 16. Capsulæ operculatæ.
17. Particula peristomii.
18. Sectio verticalis ejusdem.
- 19, 20. Operculum et calyptra.
21. Perigoniale et antheridium cum paraphysi.

HYPNUM ACUMINATUM, *Beauv.*

Tab. 116.

PLANTÆ cæspites late extensos, nunc laxos profundos nunc depresso-densiuseulos, efformantes, colore e saturate viridi lutescenti-sericeo insignes, copiose capsuligeræ.

CAULIS prostratus, radiculosus, vetustior subdenudatus; ramis vage vel remotius distiche ramulosis, ramulis inæqualibus acutis plumoso- vel subjulaceo-foliosis.

FOLIA conferta, undique erecto-patentia, recta, elongato-ovata acuta, vel ovato-lanceolata longius breviusve anguste acuminata, concava, marginibus præsertim inferioribus recurva, e medio ad apicem leniter serrulata, vix striata; costa supra medium evanescente; textura tenui, cellulis virescentibus elongatis utrinque acutis, angularibus concoloribus latioribus subquadratis granulosis: perichætialia laxa, laxius reticulata, longe filiformi-attenuata, superne vario modo curvata, costa longiore vel breviora quoadque obsoleta.

FLORES dioici, numerosi, paraphysati, ramigeni.

CAPSULA cylindræcea-oblonga vel anguste oblongo-elliptica, recta, erecta, æqualis, raro asymmetrica atque curvula, in pedicellum rutilantem subuncialem sensim defluens, rufescens, exannulata; operculo altius conico; peristomii dentibus linealilanceolatis minus crebre articulatis quam icon indicat, ciliis angustis punctatis in carina hiantibus, ciliolis subnullis.

HYPNUM ACUMINATUM, Beauv. Prod. p. 60; C. Müll. Synop. Musc. 2, p. 335; Sulliv. Mosses U. States, p. 75.

HYPNUM ERECTUM, Drumm. Musc. Amer. No. 224.

LESKEA ACUMINATA, Hedw. Sp. Musc. p. 224, t. 56; Brid. Bryol. Univ. 2, p. 296; Hook. & Wils. in Drumm. Musc. Amer. Coll. 2, No. 126-128.

LESKEA SETOSA, Hedw. Sp. Musc. p. 226, t. 57; Brid. Bryol. Univ. 2, p. 302; Hook. & Wils. in Drumm. Musc. Amer. Coll. 2, No. 124 & 125.

LESKEA RUPINCOLA, Hedw. Sp. Musc. p. 227, t. 54; Brid. Bryol. Univ. 2, p. 302.

LESKEA BEYRICHI, Hampe in Linnæa, 13, p. 47, & Icon. Musc. t. 7.

HAB. On decayed logs, on the ground near the roots of trees, and on rocks partially covered with soil, in shaded or exposed and moist or dry localities: quite common.

Varies much in size and aspect, but always within the specific limits above indicated.

Resembles closely the preceding species in general appearance and in the structure of the leaf; but is a somewhat smaller plant, and is at once known by its straight capsule and different inner peristome.

TAB. 116. — *HYPNUM ACUMINATUM*.

- 1, 2, 3. Plantæ femineæ et masculæ *naturali magnitudine*.
4. Pars rami.
- 5, 6, 7. Folia ejusdem.
- 8, 9. Areolatio folii basis et apicis.
10. Perichætium.
11. Folium perichætiale.
12. Capsula operculata et calyptrata.
13. Capsulæ operculatæ.
14. Capsula absque operculo.
15. Pars peristomii.
16. Operculum.
17. Flos masculus.
18. Folium perigoniale.
19. Antheridium et paraphysis.

HYPNUM FENDLERI, *Sulliv.*

Tab. 117.

PLANTÆ tenellæ, late denseque implexo-cæspitosæ, e pallide viridi lutescentes, nitidæ.

CAULIS prostratus, radicans, subuncialis, divisus, conferte ramulosus; ramulis inæqualibus 2–4-linearibus tenuibus tereti-foliosis.

FOLIA undique erecto-incumbentia, stricta, ovato- vel elliptico-lanceolata, longius tenuiter acuminata, concava, estriata, margine toto fere serrulato recurva; reti tenuissimo lineari, illo ad basis angulos quadrato ampliore; costa paulo ultra medium evanida; perichætii basi radicans folia solute vaginantia, erecta; interiora oblonga, subito longius filiformi-acuminata, ante acuminis basin grosse dentata, subecostata.

FLORES monoico-polygami, pro more synoici; antheridiis et archegoniis quandoque sejunctis; paraphysibus copiosis.

CAPSULA oblonga, nunc æqualis erectiuscula, nunc altero latero paululum longiore convexiore lenissime inclinata, nunquam horizontalis, platystoma, leptoderma; annulo biseriato revolubili; pedicello 5–6-lineari purpurascens basi sola asperulo; peristomii dentibus flavidis lineali-lanceolatis dense articulatis anguste hyalino-marginatis, ciliis dentium longitudine carinatis hic illic pertusis, ciliolis singulis binisve brevissimis vel subnullis; operculo magno altius obtuse conico in medio leniter constricto.

HYPNUM FENDLERI, *Sulliv. Mosses U. States*, p. 76; *Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc.* (ed. 1), No. 334.

HYPNUM VELUTINUM, var. MICROCARPUM, *C. Müll. Synop. Musc.* p. 400.

LESKEA FENDLERI, *Sulliv. in Mem. Amer. Acad. n. ser. 4*, p. 170, t. 1.

HAB. On rocks near Santa Fe, New Mexico, *Fendler*.

From the nearly related *Hypnum velutinum*, *L.*, this species is distinguished by its smaller size, its inflorescence usually synoi-

cous, its pedicel slightly scabrous at base only, its capsule oblong and suberect, and the ciliolæ of its inner peristome very short and rudimentary.

TAB. 117. — *HYPNUM FENDLERI*.

1. *Plantæ naturali magnitudine.*
2. *Pars ramuli.*
3. 4, 5, 6, 7, 8. *Folia.*
- 9, 10, 11. *Areolatio folii.*
12. *Perichætium.*
- 13, 14. *Folia ejusdem.*
- 15, 16. *Capsulæ.*
17. *Particula peristomii.*
18. *Eadem verticaliter secta.*
19. *Operculum.*
20. *Calyptra.*
21. *Flos bisexualis.*
22. *Archegonium, antheridium, et paraphysis.*

HYPNUM NOVÆ-ANGLIÆ, *Sulliv. & Lesqx.*

Tab. 118.

PLANTÆ laxæ cæspitosæ; cæspitibus tumescentibus rigidiusculis extensis superne læte viridibus parum nitidis inferne ochraceo-lutescentibus.

CAULIS $1\frac{1}{2}$ – 2 uncias longus, subprostratus; ramis primariis arcuato-ascendentibus irregulariter et subpinnatim ramulosis una cum ramulis tereti-foliosis haud attenuatis.

FOLIA erecto-incurva, subjulaceo-disposita, e basi angusta decurrente latissime ovata, brevius tenui-acuminata, maxime concava, haud striata, e basi fere ad apicem serrulata, ultra medium costata; reti angusto oblongo-vel lineari-hexagono, basilari brevior latiore: perichætalia laxè texta, subecostata, apice longe anguste attenuata; inferiora squarrosa; intima vaginantia, erecta, superne argute serrata.

FLORES dioici, paraphysati; masculis gemmiformibus.

CAPSULA oblonga, erecto-curvula; pedicello valde papilloso purpureo vix unciali; operculo alte conico acuto; annulo duplici; peristomii dentibus lanceolato-subulatis firmis crebre et prominenter articulatis, ciliis dentibus æquilongis in carina hiantibus, ciliolis longis singulis binisve interpositis.

HYPNUM NOVÆ-ANGLIÆ, *Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 338; Sulliv. Mosses U. States, p. 76.*

HAB. Mountains of New England, *Oakes, Frost, James, Eaton.*

Very near *Hypnum rivulare*, *Br. & Sch.*; but that species is much larger, and has widely spreading, more or less plicate leaves,

not so concave, with a narrower and longer areolation, and a more glossy surface.

TAB. 118. — HYPNUM NOVÆ-ANGLIÆ.

- 1, 2. Plantæ femineæ et masculæ *naturali magnitudine*.
3. Pars ramuli.
- 4, 5, 6. Folia.
7. Areolatio baseos.
8. Eadem apicis.
9. Sectio transversalis folii.
10. Perichætium.
- 11, 12, 13. Folia ejusdem.
- 14, 15. Capsulæ operculatæ.
16. Capsula absque operculo.
17. Particula peristomii.
18. Sectio verticalis ejusdem.
19. Flos masculus et perigoniale cum paraphysi.

HYPNUM HISPIDULUM, *Brid.*

Tab. 119.

PLANTÆ tenellæ, implexæ, cæspites densiusculos tenues læte virides inferne ochraceos efficientes.

CAULIS prostratus, radiculosus, inordinate et subpinnatim ramulosus; ramulis gracilibus erectis vel expansis.

FOLIA remotiuscula, horizontalia, squarrosa et squarroso-reflexa, mollia, e basi deltoideo-orbiculari subitius longe anguste acuminata, decurrentia, parum concava, toto fere margine leniter serrulata; costa gemella brevissima haud raro nulla; areolatione lineari-fusiformi, cellulis angulorum numerosis latioribus subquadratis granulosis: perichætialia albescentia, elongata, longius acuminata, acumine plerumque reflexo.

FLORES monoici, cauligeni: antheridiis paraphysatis, perigonialibus tenui-acuminatis.

CAPSULA oblonga, erecto-curvula, vel horizontalis incurva, macrostoma, luteo-fuscidula; pedicello pro plantæ exilitate longiusculo tenui pallide flavescente; annulo simplici; peristomii dentibus lineari-lanceolatis luteolis firmis; ciliis dentes æquantibus inter articulationes rimulosis, ciliolis longis appendiculatis; operculo convexo-conico apiculato.

HYPNUM HISPIDULUM, Brid. Sp. Musc. 2, p. 198; Müll. Synop. Musc. 2, p. 440; Sulliv. Mosses U. States, p. 77; Musc. Alleghan. No. 37.

HYPNUM HALLERI, var.? Hook. & Wils. in Drumm. Musc. Amer. Coll. 2, No. 147.

HYPNUM STELLATUM, var. HISPIDULUM, Brid. Bryol. Univ. 2, p. 603.

HAB. Roots of trees and the ground, on dry rocky hillsides: not uncommon.

H. Halleri has a more pinnate ramification, and more crowded and more squarrose leaves; and grows usually in dense fulvous

or brownish patches, becoming black when old. It is, besides, an alpine or subalpine species, not yet found within our limits.

H. stellatum is a much more robust plant, and has entire leaves, and a dioicous inflorescence.

H. Sommerfeltii, *Bryol. Europ.* (*H. polymorphum*, *Bryol. Brit.*) approaches very closely to *H. hispidulum*; and, except the longer and narrower acumination of the leaf of the former, (which is hardly sufficient,) there appears to be no character to separate them.

TAB. 119. — *HYPNUM HISPIDULUM*.

1. Plantæ *naturali magnitudine*.
2. Pars ramuli.
- 3, 4, 5, 6. Folia.
- 7, 8. Areolatio folii.
9. Perichætium.
10. Folium ejusdem.
11. Vaginula.
- 12, 13, 14, 15. Capsulæ.
16. Particula peristomii.
17. Calyptra.
18. Flos masculus.
19. Perigoniale.
20. Antheridium cum paraphysi.

HYPNUM MINUTISSIMUM, *Sulliv. & Lesqx.*

Tab. 120.

PLANTÆ minimæ, teneræ, laxè demisso-cæspitulosæ, pallide vel luteolo-virides.

CAULIS vix semiuncialis, prostratus, fasciculato-radiculosus; ramulis inordinate vel subpinnatim dispositis 1-2-linearibus erectis seu expansis.

FOLIA remotiuscula, in sicco æque ac in humido patula, mollia, anguste lanceolata et lineari-lanceolata, margine plus minus leniter serrulata, ample oblongo-hexagono-areolata cellulis uniformibus, ecostata vel costæ loco stria brevissima notata: folia perichætii pro plantæ minutie magni elongata, longius acuminata superne grossius dentato-serrata.

FLORES monoici, cauligeni, vix paraphysati: masculis substipitatis majusculis gemmiformibus; antheridiis 3-4 ovalibus; perigonalibus acuminato-ovatis apice serrulatis.

CAPSULA minutissima, pro more asymmetrica subovalis vel subovata cernua altero latere convexiore, rarius æqualis erecta, sicca deoperculata sub ore obliquo amplissimo constricta, turbinata, pallide fuscescens, tenui-membranacea; pedicello debili 2-3-linearibus; annulo distincto duplici persistente; peristomii dentibus luteolis firmis lanceolato-subulatis crebrius articulatis margine hyalino circumductis intus lamelligeris, ciliis carinatis integris e membrana plicata ad medios fere dentes producta, ciliolis singulis binisve longiusculis.

HYPNUM MINUTISSIMUM, *Sulliv. & Lesqx.* *Musc. Bor.-Amer. Exsicc.* (ed. 1), No. 343; *Sulliv. Mosses U. States*, p. 78.

HYPNUM CONFERVOIDES, *Sulliv. Musc. Alleghan.* No. 31, ex parte.

HAB. On moist rocks in shaded ravines, Central and Southern Ohio: rare.

This species is a true *Amblystegium*, *Bryol. Europ.*, and resembles very closely *Amblystegium Sprucei* (*Hypnum Conferva*, *Drumm. Musc. Amer. No. 190*; *Platydictya Sprucei*, *Berk.*), particularly in its normally asymmetrical and cernuous capsule; differing mainly in the inflorescence, which in the latter species is dioicous.

Amblystegium confervoides, *Bryol. Europ.*, another very nearly related species, is a larger and more rigid plant, has a more pin-nate ramification, longer and thicker branches, and leaves more crowded, appressed when dry, entire on their margins, and of a closer areolation: its capsule also is oblong and incurved.

Two other species of *Amblystegium*, *A. subtile* and *A. tenuissimum* are near allies of our plant; the first, however, is larger, and has shortly bicostate and entire perichæatial leaves, an oblong capsule, and a peristome without ciliolæ; in the second species (not found in this country) the capsule is oblong and erect, the perichæatial leaves are costate beyond the middle, and the annulus is absent.

TAB. 120. — *HYPNUM MINUTISSIMUM*.

1. Planta naturali magnitudine.
2. Planta capsuligera et antheridiophora.
3. Pars ramuli.
4. Folia.
5. Folium areolationem exhibens.
6. Folia perichætialia.
7. Capsula operculata.
- 8, 9. Capsulæ humidæ deoperculatæ.
10. Eædem siccæ evacuatæ.
11. Particula peristomii.
12. Dens ejusdem a latere visus.
13. Operculum.
14. Calyptra.
15. Flos masculus.
16. Perigoniale et antheridium.

HYPNUM ADNATUM, *Hedw.*

Tab. 121.

PLANTÆ pusillæ; in cæspitibus demissis densis saturate viridibus degentes.

CAULIS arcte reptans, subuncialis, divisus; divisionibus plus minus distiche ramulosis; ramulis brevibus 1–3 lineas longis subterete foliosis prostratis vel erectis.

FOLIA confertiora, erectiuscula, late lanceolata vel elliptico-lanceolata, sensim obtuse acuminata, profundius concava, integerrima, margine inferiore anguste recurva, ecostata vel striis gemellis costæformibus brevibus prædita, amœne pellucide subrhombæo-areolata; cellulis angularibus minoribus quadratis subopacis: perichætialia externa subobovata, apiculata, patentia; interiora majora, erecta, elliptico-oblonga, subito tenuiter acuminata, ad acuminis basin grosse irregulariter dentata, distinctius semicostata.

FLORES monoici in caule vel ejusdem divisionibus, paraphysati.

CAPSULA oblonga, erecto-cernua, inæqualis, in pedicellum 5–7-linearem inferne rubellum superne flavescens sensim angustata, leptoderma, matura olivacea, dein badia; annulo subpersistente; peristomii dentibus lineali-lanceolatis luteolis, ciliis imperforatis, ciliolis singulis binisve; operculo pallido convexo-conico longius breviusve operculato.

HYPNUM ADNATUM, Hedw. Sp. Musc. p. 248, t. 64; Brid. Bryol. Univ. 2, p. 591; C. Müll. Synop. Musc. 2, p. 339; Sulliv. Mosses U. States, p. 78; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 344.

HAB. Shady woods, on stones near the surface of the ground; also on trees: common.

Specimens of this species growing on stones, its usual habitat, are somewhat smaller than those (here figured) found on trees, and form thinner and denser mats, with shorter and more numerous capsules, and a less regularly pinnate ramification.

TAB. 121. — *HYPNUM ADNATUM*.

1. *Planta naturali magnitudine.*
2. *Ramulus.*
- 3, 4, 5. *Folia ejusdem.*
- 6, 7. *Portiones folii areolationem basilarem et apicalem monstrantes.*
8. *Perichætium.*
- 9, 10. *Folium ejusdem.*
- 11, 12, 13, 14. *Capsulæ.*
- 15, 16. *Opercula.*
17. *Particula peristomii.*
18. *Flos masculus, perigoniale cum antheridio et paraphysi.*

HYPNUM ORTHOCLADON, Beauv.

Tab. 122.

PLANTÆ proceriores, in cœspitibus laxis extensis tumescentibus profundis e saturate viridi flavescentibus degentes.

CAULIS prostratus, 2–3-uncialis, divisus, valde radiculosus, ramos simplices vel subpinnatim ramulosos numerosos erectos unciales et longiores proferens.

FOLIA caulis ejusque divisionum e basi cordata late ovata, longius acute acuminata; ramorum et ramulorum angustiora; omnia laxiuscula, erecto-patentia, modice concava, integerrima vel obscure serrulata; costa crassa ad summum fere apicem pertinente; textura (in vivis) carnosiuscula e cellulis chlorophyllosis satis minutis subrhomboideis formata: perichætialia erecta; interiora membranacea, lineari-areolata, substriata, oblongo-lanceolata, apice obtusiuscula distincte dentata, dehinc costa latissima excedente breviter cuspidata.

FLORES dioici in caule primario, paraphysati; perigonialibus ecostatis apice attenuatis.

CAPSULA majuscula, in pedicello longo flexuoso rubro oblongo-cylindræa, leviter incurvo-cernua, sicca arcuata sub ore contracta, e luteo fuscescens, longicolla; annulo simplici angusto; peristomii dentibus lanceolato-subulatis basi coalitis auranteis, ciliis æquilongis in carina vix rimulosis eque membrana pallidiore plicata medios dentes æquante ortis, ciliolis longis binatis ternatisve nodoso-articulatis; operculo amplo tumido-conico minute apiculato.

HYPNUM ORTHOCLADON, Beauv. Prod. p. 72; Brid. Bryol. Univ. 2, p. 537; Hook. & Wils. in Drumm. Musc. Amer. Coll. 2, No. 138, 139; Sulliv. Mosses U. States, p. 78; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 347.

HYPNUM VARIUM, Hook. & Wils. in Drumm. Musc. Amer. Coll. 2, No. 142.

HYPNUM SERPENS, var VARIUM C. Müll. Synop. Musc. 2, p. 412.

HAB. Margins of swamps and wet springy places, on the ground and decayed logs: very common and variable.

H. orthocladon, *H. contextum*, *H. tenax*, *H. inordinatum*, and *H. varium*, attributed to this country only, are (together with a few other supposed species, including *H. radicale*, found both here and in Europe) so variable in their characters, and pass so gradually into each other, that it appears to be quite impracticable to define their specific limits, or to separate them from large forms of *H. serpens*, to which they have been referred by Müller and others.

TAB. 122. — HYPNUM ORTHOCLADON.

1. Planta naturali magnitudine.
2. Ramulus.
- 3, 4, 5. Folia ejusdem.
- 6, 7. Areolatio folii baseos et apicis.
8. Perichætium basi radicans.
- 9, 10. Folia ejusdem.
- 11, 12. Capsulæ.
13. Particula peristomii.
- 14, 15. Opercula.
16. Flos masculus.
17. Folium perigoniale
18. Antheridium cum paraphysi.

HYPNUM COMPACTUM, *C. Müll.*

Tab. 123.

PLANTÆ graciliores, condensato-cæspitosæ, in cæspitibus latis plus minus profundis superne virescentibus inferne rubiginosis degentes.

CAULIS tenuis, uncialis et ultra, plerumque erectus, fasciculato-ramosus, toto fere longitudine stupa radiculari obrutus; ramis conferte foliosis.

FOLIA undique erecto-patentia, rarius subsecunda, anguste ovato-lanceolata, sensim acuminata, basi decurrentia, caviuscula, margine præcipue inferiore leniter serrulata; costa crassa ad summam fere apicem perdurante; reti laxiusculo, cellulis angularibus paucis subquadratis, cæteris angulari-fusiformibus: perichætialia oblonga, subitius tenui-acuminata, apice distincte serrulata, costa debili.

FLORES ex cl. Müller monoici.

CAPSULA erecta vel leniter inclinata, æqualis, oblonga vel subclavato-oblonga, raro subinæqualis incurvula, leptoderma, alte pedicellata, sicca sub ore magno constricta, collo distincto; peristomii dentibus lanceolato-linearibus dense articulatis pallide luteolis, ciliis æquilongis in carina rimulosis, ciliolis singulis brevissimis; annulo simplici angusto; operculo conico brevissime tenui-rostellato; calyptra dimidiata brevi vix infra operculum procedente.

HYPNUM COMPACTUM, *C. Müll. Synop. Musc. 2, p. 408.*

HYPNUM SERPENS, var. COMPACTUM, *Drumm. Musc. Amer. No. 188.*

HAB. On decayed wood, British America, *Drummond.* Oregon, *Lyall.*

The compact mode of growth, the suberect clavate-oblong and wide-mouthed capsule, the short and slender rostrum of the

operculum, the short calyptra wide at the base, and the leaves conspicuously dentate on their lower margins only, furnish this species with decided characters separating it from any of the forms of *Hypnum serpens*.

TAB. 123. — *HYPNUM COMPACTUM*.

1. Plantæ fertiles *naturali magnitudine*.
- 2, 3. Partes ramulorum.
- 4, 5, 6, 7. Folia caulina et ramulina.
- 8, 9. Areolatio folii baseos et apicis.
10. Sectiones transversales folii.
11. Perichæcium cum pedicelli basi.
12. Folia perichæcialia.
13. Capsula operculata.
14. Capsulæ operculis delapsis.
15. Capsula exsiccata.
16. Operculum et calyptra.
- 17, 18. Opercula.
19. Particula peristomii.
20. Sectio verticalis ejusdem.

HYPNUM LESCURI, *Sulliv.*

Tab. 124.

PLANTÆ mediocres, cæspites laxiusculos tumescentes saturate virides efficientes.

CAULIS prostratus, plus minus defoliatus, divisus; ramis ramulisque irregulariter dispositis confertioribus inæqualibus adscendentibus.

FOLIA laxius incumbentia, undique erecto-patentia, raro sub-homomalla, crassiuscula, opaca, toto fere ambitu leniter obtuse serrulata; caulina late ovata, breviter acuminata; ramulina angustiora, brevius ovali-lanceolata; omnia concava, limbo lato luteo e cellulis flexuoso-linearibus 4-5-seriatis exstructo circumdata; costa valida usque in apicem obtusiusculum porrecta; reti e cellulis hexagono-oblongis granulis chlorophyllosis impletis: folia perichætii basi radicantis erecta, solute vaginantia; inferiora ovata, acuminata; superiora oblongo-lanceolata, costa ex-eunte cuspidata, longitrorsum striata.

FLORES monoici, cauligeni; masculi gemmacei; perigonalibus ecostatis.

CAPSULA oblonga, erecto-cernua, brevicolla; pedicello vix unciali rubello; peristomii dentibus aureis basi confluentibus crebre articulatis; ciliis in carina hiantibus, ciliolis binis longiusculis interpositis; annulo lato composito; operculo e basi convexo-conica breviter apiculato.

HYPNUM LESCURI, Sulliv. Mosses U. States, p. 79; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 350.

HAB. On moist rocks, Tallulah Falls, Georgia, *Lesquereux*. Brattleboro, Vermont, *Frost*. York County, Pennsylvania, *Porter*.

A marked character in this species is the broad margin surrounding the leaf, a peculiarity found in no other species belonging to the section *Amblystegium*.

TAB. 124. — HYPNUM LESCURI.

1. Plantæ *naturali magnitudine*.
2. Pars ramuli.
3. Eadem caulis.
4. Folia ramulina.
- 5, 6, 7. Folia caulina.
8. Pars folii areolationem monstrans.
9. Perichætium cum pedicelli parte.
10. Folium perichætiale.
11. Capsula operculata.
12. Capsulæ absque operculis.
13. Particulæ peristomii et annuli.
14. Flos masculus.
- 15, 16. Folia ejusdem.

HYPNUM FULVUM, *Hook. & Wils.*

Tab. 125.

PLANTÆ molles, late laxissime depresso-cæspitosæ, fulvæ, sericeo-nitentes, ætate brunneo-fusæ.

CAULIS prostratus, stolonifer, 4 – 5-divisus; divisionibus elongatis parce ramulosis interrupte latius et angustius complanato-foliosis.

FOLIA laxa, complanata, tenuia, flaccida, ovato-lanceolata, in acumen longiusculum leniter serrulatum attenuata, marginibus plana vel recurva, ecostata vel obsolete gemello-costata; reti angustissimo flexuoso-lineari, angulorum ampliato: perichætialia vaginulam laxè amplexantia, interiora elongata sensim longe acuminata.

FLORES monoici; masculi gemmiformes; antheridiis 8 – 12; paraphysibus longioribus numerosis.

CAPSULA pro plantæ magnitudine parva, cernua, e collo distincto gibboso-ovalis, plagiostoma, exannulata; pedicello tenui 1 – 2-unciali; peristomii aurantii dentibus lanceolato-subulatis crebre articulatis intus lamelligeris, ciliis in carina integris, ciliolis singulis brevioribus; operculo turgido-conico breviter apiculato.

HYPNUM FULVUM, Hook. & Wils. in Drumm. Musc. Amer. Coll. 2, No. 110; Sulliv. Mosses U. States, p. 80.

HAB. Louisiana, *Drummond*. Sphagnous swamps near Augusta, Georgia, *Gray*.

The smallness of the capsule in proportion to the size of the plant, the absence of an annulus, and the very long and narrow cells composing the leaves, are the principal marks of this species, readily distinguishing it from other *Hypna* of the section *Plagiothecium*.

The plant imparts to warm water, in which it is immersed, a deep saffron color.

TAB. 125. — HYPNUM FULVUM.

1. Plantæ fertiles *naturali magnitudine*.
2. Pars rami.
- 3, 4. Folia ejusdem.
- 5, 6. Areolatio basilaris et apicalis eorundem.
7. Perichætium cum pedicelli parte.
8. Folium perichætiale.
- 9, 10. Capsulæ deoperculatæ.
11. Particula peristomii.
- 12, 13. Opercula.
14. Flos masculus et perigoniale.

HYPNUM SULLIVANTLÆ, *Schimp.*

Tab. 126.

PLANTÆ in cæspitibus densiusculis e flavescente læte viridibus sericeo-nitentibus degentes.

CAULIS uncialis et ultra, ascendens, pauciramosus; ramis erectis basi laxifoliis radiculosis superne compressiuscule turgido-foliosis.

FOLIA confertius incumbentia, oblongo-ovata, subitius breviter filiformi-apiculata, subcymbiformi-concava, tenuia, nitida, versus apicem serrulata; costa basilari bifurca, crure altero nonnunquam ad medium usque procedente; reti e cellulis angustissimis longissimis flexuosis utrinque attenuatis ad angulos defluentes amplioribus oblongis: perichætialia erecta, laxius vaginantia; interiora oblonga, apice tenui-acuminata.

FLORES dioici, utrique paraphysati, ad ramorum basin siti; masculis 2-3 aggregatis.

CAPSULA e collo angustiore cylindraceo-oblonga, erecta, æqualis, rarius subinæqualis leniter cernua, leptoderma, sicca lævis; pedicello unciali rubro; annulo simplici majusculo; peristomii dentibus lanceolato-subulatis conferte articulatis luteolis, ciliis æquilongis angustis integris, ciliolis binis nodoso-articulatis; operculo alte conico sensim oblique crasso-rostrato:

HYPNUM SULLIVANTLÆ, W. P. Schimp. in litt. ad Lesqx.; *Sulliv. Mosses* U. States, p. 80; *Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc.* (ed. 1), No. 355.

PLAGIOTHECIUM SULLIVANTLÆ, Schimp. *Bryol. Europ. Plag.* p. 16, in adnot.

HAB. On rocks in dense woods, Central and Southern Ohio: rare.

Authentic specimens of *Plagiothecium Ræseanum* are not at hand for comparison; but in the description and figure of that

species (Bryol. Europ. 5, Plag. p. 15, t. 504) characters sufficient to separate it from the species under notice are not apparent. And there may be a doubt whether the better course would not be to reduce both of them to *Plagiothecium sylvaticum*, a species subject to very considerable variation.

TAB. 126. — HYPNUM SULLIVANTÆ.

- 1, 2. Plantæ femineæ et masculæ *naturali magnitudine*.
3. Ramus capsuliger.
4. Folia ejusdem.
- 5, 6. Areolatio folii.
7. Perichætalia cum folio interiore.
8. Archegonium.
9. Capsula operculata.
- 10, 11. Capsulæ absque operculis.
12. Particulæ peristomii et annuli.
13. Operculum.
14. Flores masculi.
15. Antheridia et paraphyses.



HYPNUM WRIGHTII, *Sulliv.*

Tab. 127.

PLANTÆ stratum laxius implexum saturate viride aureo-rufescente variegatum efficientes.

CAULIS prostratus, subtus tota longitudine radiculosus, inordinate pauciramosus; ramis elongatis decumbentibus laxè bifariam foliosis.

FOLIA complanata, e basi ovata caviuscula late oblonga, plus minus obtusa, apiculata vel leniter acutata, superne obsolete serrulata; lateralia patentissima, basi obliquata uno latere inflexo, antica et postica subappressa; costa valida ultra medium producta; reticulo amœno e cellulis rhombeo-ovalibus utraque folii pagina leniter protumidis, angularibus permultis minoribus quadratis transverse oblongisque griseis confertis: folia perichæti oligophylli laxa, erecta, semicostata, in acumen tenue distincte serrulatum educta.

FLORES monoici in caulibus ramisque, paraphysati; antheridiis numerosis.

CAPSULA parvula, oblonga, erecta, æqualis, vel parum asymmetrica leniter cernua, tenui-membranacea, basi in pedicellum breviusculum rubellum attenuata; vaginula emergente; annulo nullo; peristomii pallide luteoli dentibus lanceolato-subulatis dissitius articulatis, ciliis in carina fissis, ciliolis singulis brevioribus; operculo conico brevirostro; calyptra angusta lævi uno latere fissa.

OMALIA WRIGHTII, Sulliv. Mosses U. States, p. 65; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No: 269.

HAB. On roots of trees, San Antonio, Texas, *Wright*. Santa Fé, New Mexico, *Fendler*.

A very distinct species, not easily confounded with any other

known. In its suberect capsule and oblong semicostate and complanate leaves a relationship with the genus *Omalia* is indicated.

TAB. 127. — *HYPNUM WRIGHTII*.

1. Plantæ fertiles *naturali magnitudine*.
2. Pars rami.
- 3, 4, 5. Folia ejusdem.
- 6, 7. Areolatio basilaris et apicalis folii.
8. Perichæcium.
- 9, 10. Folia ejusdem.
- 11, 12, 13. Capsulae cum et absque operculis.
14. Particula peristomii.
15. Eadem verticaliter secta.
- 16, 17. Opercula.
18. Calyptra.
19. Flos masculus, perigoniale, antheridium, et paraphysis.

HYPNUM NUTTALLII, *Wils.*

Tab. 128.

PLANTÆ colore aureo-nitente insignes, cæspites late extensos depressos formantes.

CAULIS prostratus, breviter fasciculato-radiculosus, 3–5 uncias longus, parcius divisus, pinnato-ramulosus; ramulis confertissimis brevibus 3–5-linearibus nunc expansis nunc homomallis curvulis ascendentibus.

FOLIA dense imbricantia, erecto-patentia, stricta, anguste oblongo-lanceolata, longe sensimque acuminata, plus minus sulcato-striata, serrata, ad marginem basilarem recurvum grossius dentata; costa alte in acumen producta; reti firmo e cellulis longissimis angustis, illis ad basis angulos latioribus subquadratis hyalinis: perichætialia interiora erecta, elongato-oblonga, filiformi-attenuata, striata, obsolete costata, laxius texta.

FLORES pseudo-monoici (normaliter dioici ex cel. Wilson): masculi plantulæ gemmiformes, basi radiculigeræ, e sporis enatæ in plantis femineis parasiticæ, sæpius 2–4 aggregatæ; antheridiis minimis; paraphysibus nullis vel rudimentariis.

CAPSULA elongato-cylindracea, erectiuscula, curvula, sicca arcuata, collo parvulo distincto; pedicello valde exasperato perbrevis capsulam paulum superante vel æquante vel ea brevior; annulo angusto; peristomii dentibus lanceolato-subulatis dense articulatis hyalino-marginatis, ciliis in carina diremptis, ciliolis subnullis; operculo tumido-conico brevirostro; calyptra angusta dimidiata.

HYPNUM NUTTALLII, Wils. Bryol. Brit. in adnot. p. 334, 339; Sulliv. & Lesqx. Musc. Bor.-Amer. Exsicc. (ed. 1), No. 338^b.

CAMPOTHECIUM NUTTALLII, Bryol. Europ. in adnot. 6, p. 6.

LESKEA CALIFORNICA, Hampe in Linnæa, 30 (1859), p. 460.

HAB. On trees, Western Coast of North America, *Menzies*, *Gairdner*, *Nuttall*, *Bigelow*, *Bauer*, *Bolander*.

Hypnum Nuttallii is distinguished from *Hypnum aureum* by its longer and more erect cylindrical capsule, shorter rostrate operculum, less perfect inner peristome, and especially by its much shorter pedicel and the strongly dentate lower margin of the leaf.

The same characters, together with its densely pinnate ramification, separate it from *Hypnum lutescens*.

These three species form a very natural group, composing the genus *Camptothecium* of the admirable Bryologia Europæa, and are remarkable for the presence of small male buds produced from spores, usually in clusters, and evidently parasitic on the fertile plants. The normal inflorescence, however, is said by authors to be dioicous.

TAB. 128. — HYPNUM NUTTALLII.

1. Planta fertilis *naturali magnitudine*.
2. Pars ramuli.
3. Folia ejusdem.
4. Areolatio folii baseos.
5. Eadem apicis.
6. Cellulæ ejusdem.
7. Sectiones transversales folii.
8. Perichætium.
9. Folium ejusdem.
10. Capsulæ operculatæ.
11. Particula peristomii.
12. Operculum.
13. Calyptra.
14. Pars pedicelli.
15. Inflorescentia pseudo-monoica.
16. Pars ramuli cum gemmis masculis parasiticis.
17. Folium perigoniale cum antheridio.

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* * * Synonyma, etc., literis cursivis indicantur.

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SPARGANIUM MACROPHYLLUM, Bernh.



SPHAGNUM PORTORICENSE. Hampe.





SPHAGNUM HUMILE. Schreb.



SPHAGNUM MOLLE, Sulzv.



SPHAGNUM. MUELLERI. Schmp.





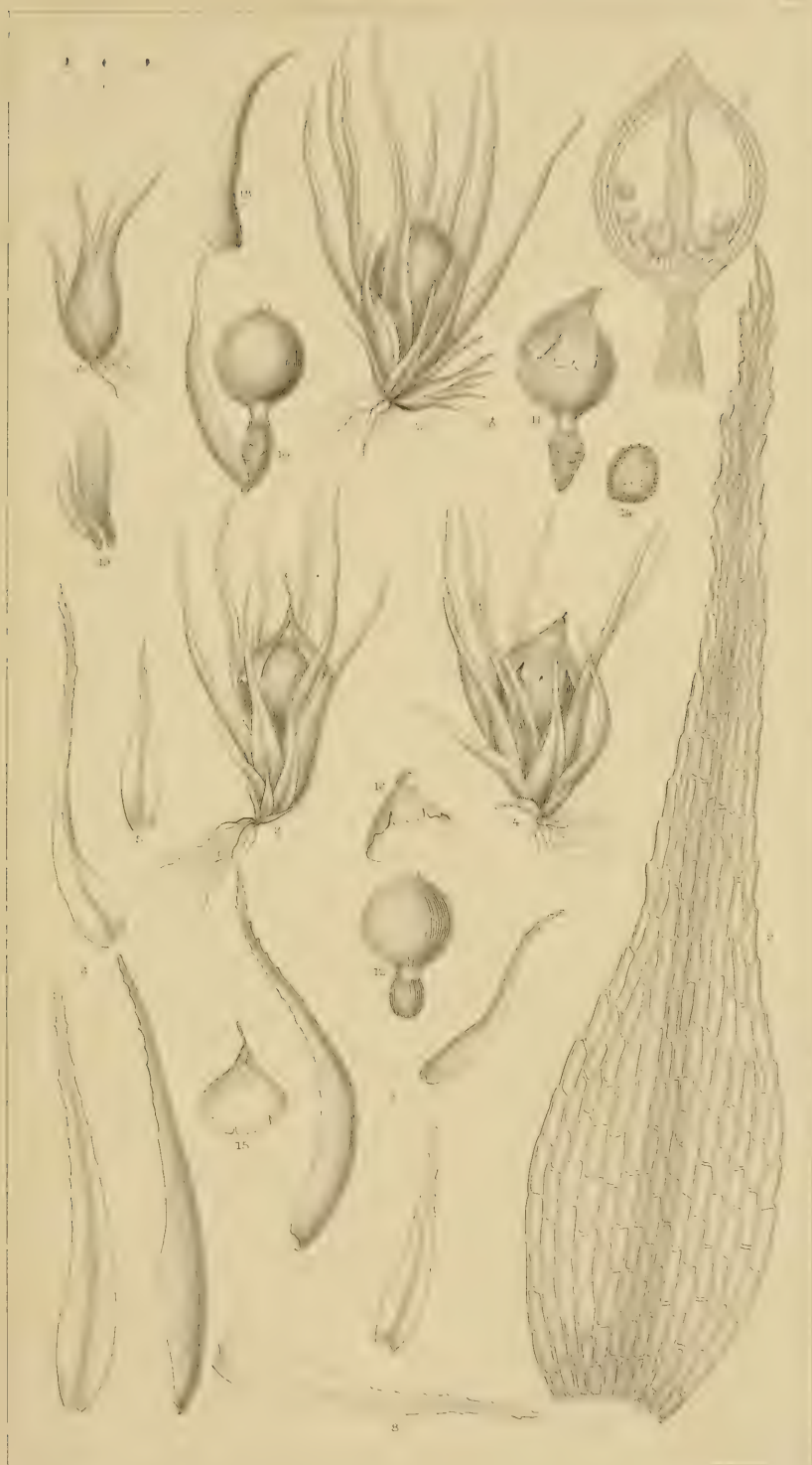
SPHAGNUM SEDOIDES, Brd.

SPHAGNUM PYLAESII, Brd.

SPHAGNUM CYCLOPHYLLUM, Sulliv. et Lesq.



ARCHIDIUM OHIOENSE, Schimp.



EPHEMERUM CRASSINERVIUM, (Schwaegr.) Hampe.



ACAULON SCHIMPERIANUM, Sulliv.



PLEURIDIUM NERVOSUM, (Hook) Brid.



ASTOMUM SULLIVANTII, (Schimp.) Hampe.



ASTOMUM LUDOVICIANUM, Sulliv.



BRUCHIA FLEXUOSA, Schwaegr.



BRUCHIA BREVIPES.



BRUCHIA BREVIFOLIA, Sulliv.



BRUCHIA RAVENEI, Wils.



A. *CAMPYLOPUS TALLULENSIS*, Sulliv. et Lesqx.

B. *CAMPYLOPUS LEUCOTRICHUS*, Sulliv. et Lesqx.





A. *CAMPYLOPUS LEANUS*, Sulliv.

B. *CAMPYLOPUS VIRIDIS*, Sulliv. et Lesq.



TREMATODON LONGICOLLIS. M. L. H.



DICRANUM DEBILE, Hook et Wils.





FISSIDENS OBTUSIFOLIUS, Wils.



FISSIDENS EXIGUUS, Sullv.



FISSIDENS MINUTULUS, Sulliv.



PICOIDES RAVENELLI COOPER



FISSIDENS POLYPODIODES, Hedw.





TRICOSTOMUM VAGINATUM, Solms



DESMATODON ARENACEUS, Sullivet Lesqx.



DESMATODON PLINTHORIIUS, Sulliv. et Lesq.



SYRRHOPODON FLORIDANUS, Sulliv.





DRUMMONDIA CLAVELLATA, Hook.



ORPHOTRICHUM TEXANUM, Sulliv.



ORTHOTRICHUM EXIGUUM, Sulliv.



ORTHOTRICHUM STRANGULATUM, Beauv.



MACROMITRIUM DREGEI, Hornsch.



SCHLOTHEIMIA SULLIVANTII, C. Müller.



PTYCHOMITRIUM INCURVUM, (Schwaegr.) Br. et Sch.



PTYCHOMITRIUM DRUMMONDII, (Hook. et Wils.) Br. et Sch.



GRIMMIA AMBIGUA, Sulliv.



GRIMMIA OLINFYI, Sulliv.



GRIMMIA. PENNSYLVANICA, Schwaegr.



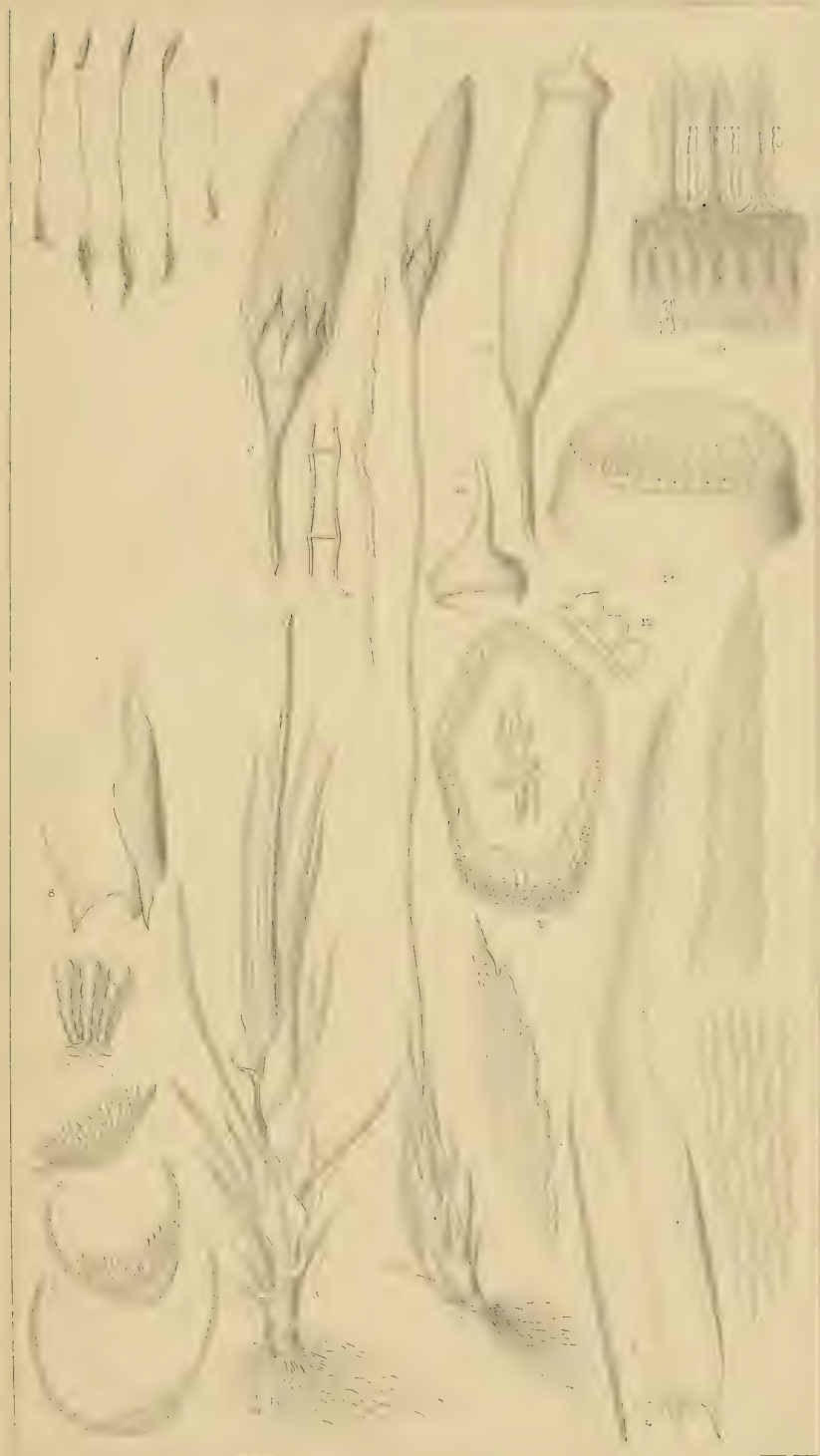
GRINNIA CALYPTRATA, Hook.



COSCINODON WRIGHTII, Solliv.



ATRICHUM CRISPUM, James.



POGONATUM BREVICAULE, Brd.



POGONATUM BRACHYPHYLLUM, Michx.



POGONATUM CAPILLARE, Michx.





BRYUM LESCURIANUM, Sulliv.



MNIUM DRUMMONDII, Br. et Sch.



BARTRAMIA RADICALIS, Beauv.



FUNARIA FLAVICANS, Michx.



FUNARIA SERRATA, Beauv.





ENTOSTHODON DRUMMONDII, Sulliv.



PHYSCOMITRIUM IMMERSUM, Sulliv.



APHANORHEGMA SERRATUM, (Hook. et Wila.) Sulliv.



TETRAPIODON AUSTRALIS, Sulliv et Lesq.



MENTINALIS BIPOLIS. Sulliv.



FONTINALIS BIFORMIS, Sully.



FONTINALIS LESCUREI, Sulliv.



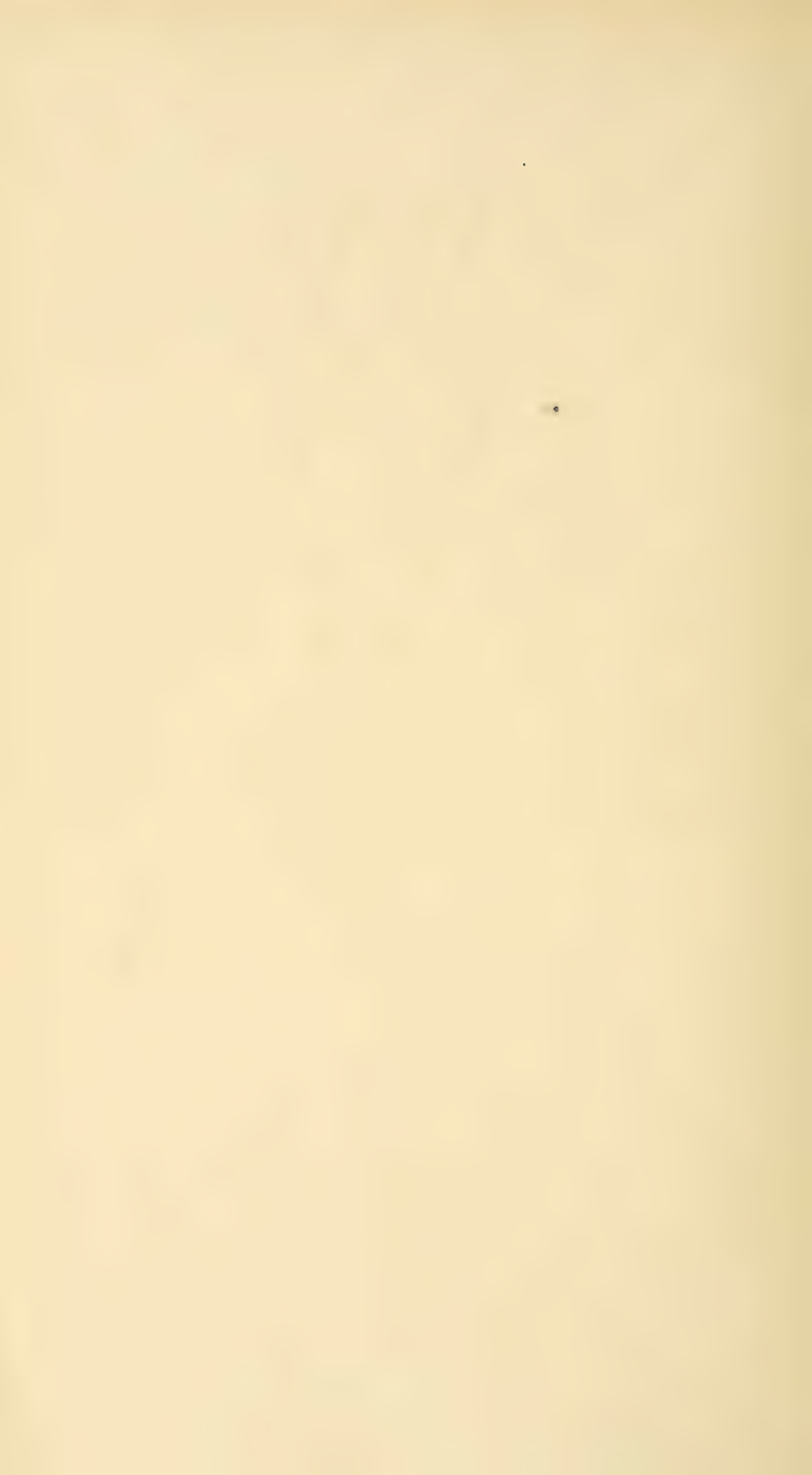
FONTINALIS LESCUREI, VAR.



FONTINALIS DISTICHA, Hook. et Wils.



FONTINALIS DISTICHA, VAR.





FONTINALIS NOVAE ANGLIAE. Sully.



FONTINALIS ANTIPYRETICA, VAR. GIGANTEA.



CRYPHAEA GLOMERATA, Schimp.



CRYPHAEA NERVOSA, Hook. et Wils.



LEUCODON JULACEUS, (Hedw.) Schwaegr.



LEUCODON BRACHYPUS, Brid.



LEPTODON TRICHOMITRIUM, (Hedw.) Brid.



LEPTODON OHIOENSE, Sulliv.



ALSIA ABIETINA, (Hook.) Sulliv.





MILTARIUM PENDULUM, Solms.



ANOMODON OBTUSIFOLIUS, Br et Sch.



ANOMODON APICULATUS, Br et Sch.



A. ANOMODON TOCCOAE, Sulliv et Lesqz.

B. PILOTRICHUM CYMBIFOLIUM, Sulliv.



LESKEA OBSCURA, Hedw.



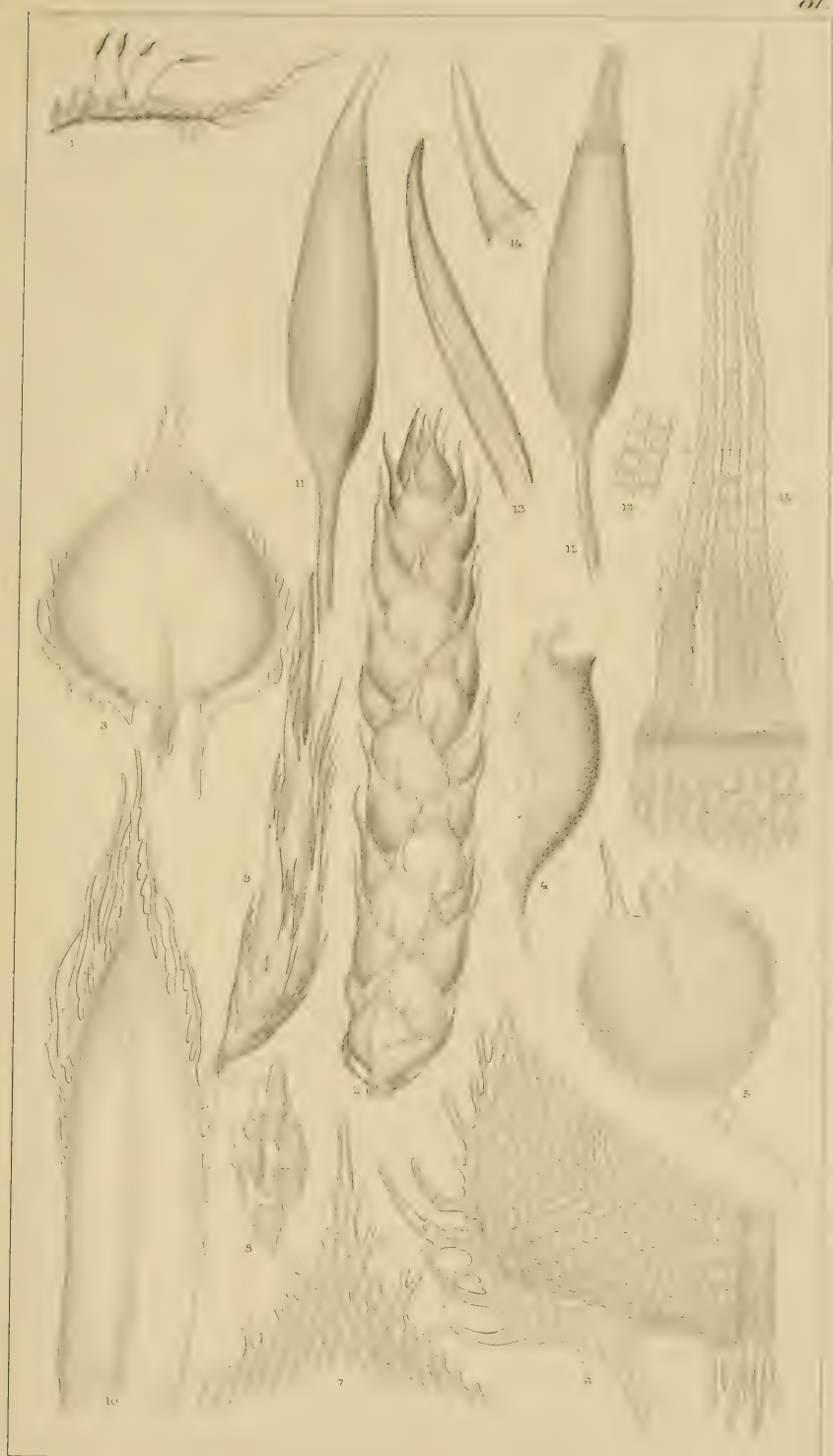
LESKIA DENTICULATA, Sulliv.



CLASMATODON PARVULUS, (Hampe) Hook. et Wils.



THELIA HIRTIFOLIA, (Nedw) Sulliv.



THELEIA ASPRELLA, (Schimp) Sulliv.





MYURELLA CAREYANA, Sulliv.



FABRONIA WRIGHTII, Sulliv.



FABRONIA RAVENEI, Sulliv.



FABRONIA GYMNSTOMA, Sulliv. et Lesq.



PYRAISA SUBDENTICULATA, Schimp.



PYLISAEAE INTRICATA, (Hedw.) Schimp.



PYLAISARA VELUTINA, Schump.



HOMALOTHECIUM SUBCAPILLATUM, (Hedw.) Schimp.



CYLINDROTHECIUM CLADORRHIZANS, (Hedw) Schimp



CYLINDROTHECIUM SEDUCTRIX, (Hedw) Schimp.



CYLLORORHYNCHIUM COMPRESSUM, (Hedw.) Schimp.



CYLINDROTHECIUM DRUMMONDII, Schimp.



CYLLINDROTHECIUM SULLIVANTII, (C. Müller) Schimp.



CYLLINDROTHECIUM BREVISETUM, (Hook et Wils) Schimp





HYPNUM PYGMAEUM, Schimp.



HYPNUM SCITUM, Beauv.



HYPNUM GRACILE, Br. et Sch.



HYPNUM PALUDOSUM, Sulliv.



HYPNUM OKESII, Sulliv.



HYPNUM ATEGHAMIENSE, C. MILL.



HYPHNUM HIANZ. Zsch.



HYPSIDRUM SUTIVANII. Spruce





HYPNUM BOSCHII. Schreb.



LYPNUM SERRULATUM, Hedw.

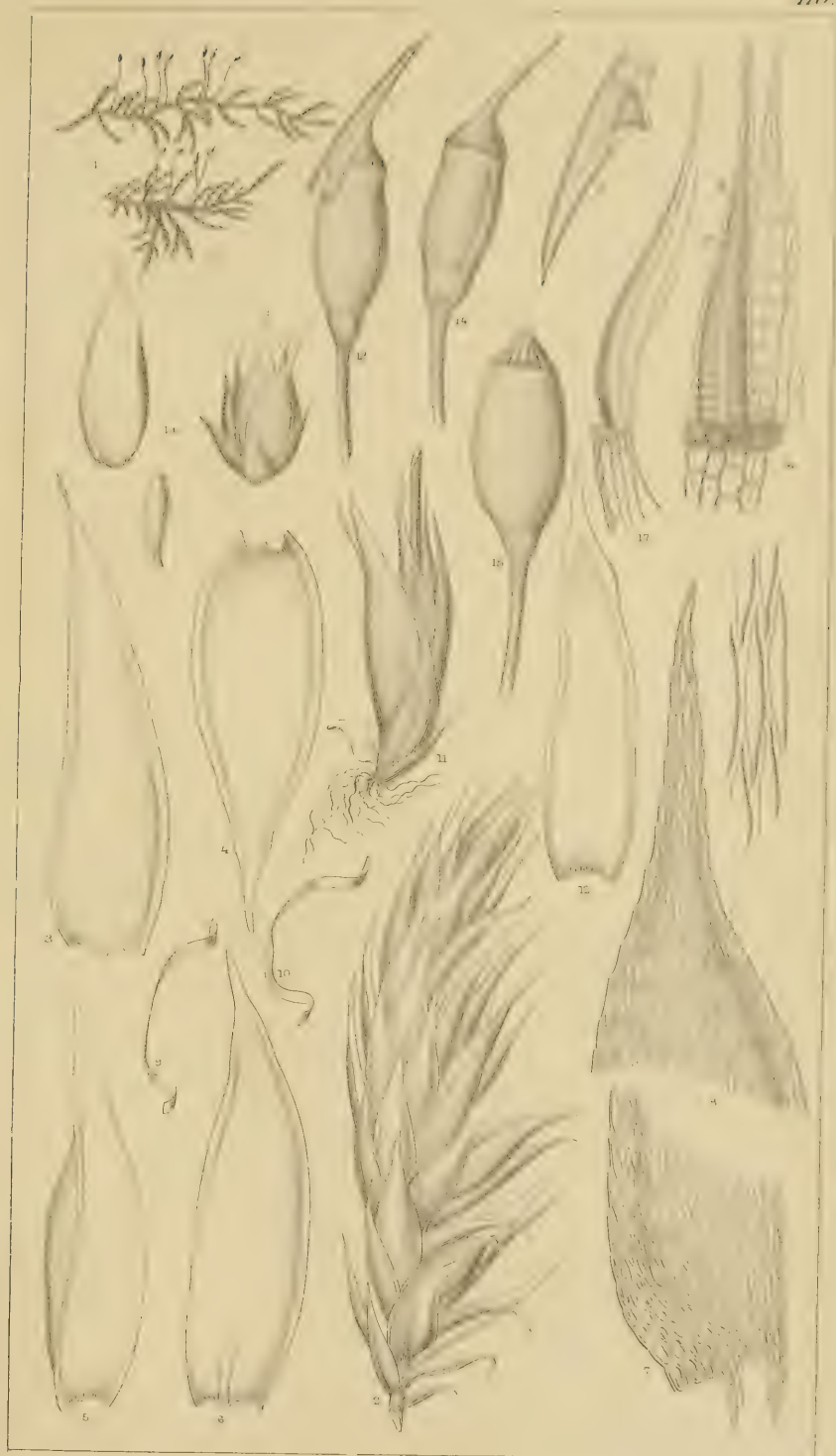




HYPNUM DEPLANATUM, Schimp.



EUPHORBIA CYLINDROCARPUM, CANAL.



HYPNUM MICROCARPUM, C. Mill.



HYPNUM RECURVANS, Schwagr.



HYDRUM VERMICUM, C. SM.





HYDNELL CURVIFOLIUM, Hedw.



HYENIUM LAETUM, End





HYPNUM FENDLERI, J. D. D.



Urtica dioica L. var. dioica



HYSSOPUS HISPIDULUM, Benth.



HYPNUM MINUTISSIMUM, Suess. et Le. ex.



HYPNUM ADNATUM, Hedw.



HYPNUM ORTHOCLADON, Beauv.



HYPNUM COMPACTUM, C. MILL.



HYPNUM LESOURII. Sully





HYDRUM POLVUM. Hook & Wils



HYPNUM SULLIVANIANUM, Schimp



RHIPIDURA WRIGHTII. Ashw.



HYPNUM NUTTALLII, WALP.

